Wednesday, September 10, 1924. Vol. LX. No. 1549.

THE ARCHITECTS' JOURNAL & Architectural Engineer

With which is incorporated "The Builders' Journal."

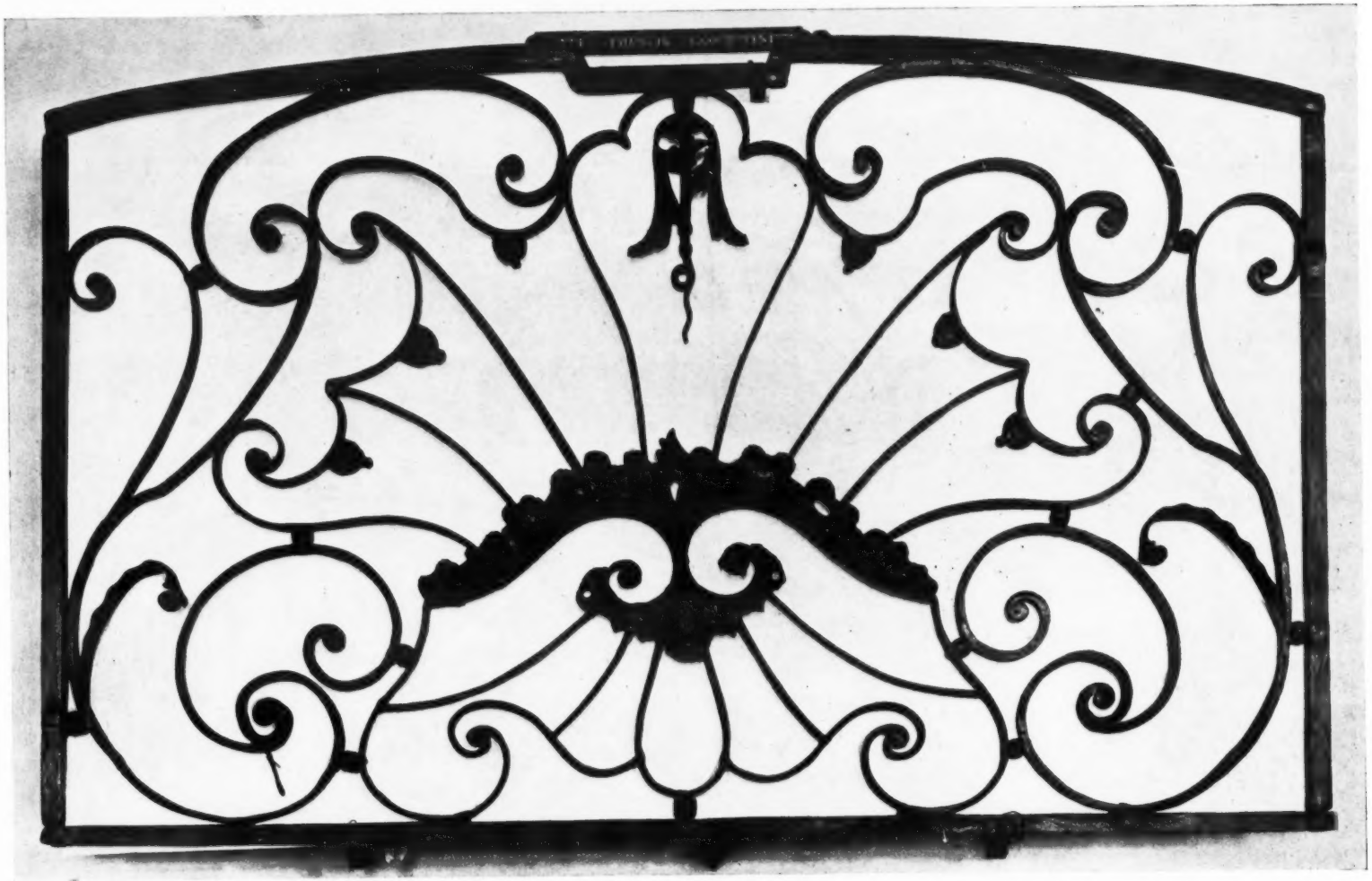
FROM AN ARCHITECT'S NOTEBOOK.

"In spite of spite I will always remain of opinion that in the neighbourhood of a mansion-house (itself an artificial object) such decorations as terraces, alleys, fountains, and so forth, where vegetable and architectural ornaments are blended together, add dignity and interest to the whole, connect the reigns of Art and Nature, and prepare for gliding from the regions where the former presides into the wide extended regions of the latter."

SIR WALTER SCOTT: "Redgauntlet."

27-29 Tothill Street, Westminster, S.W.1.

Details of Craftsmanship. 27.—A Grille for a Fanlight



This grille is French work of the late seventeenth century. The original is now in the Victoria and Albert Museum, with whose permission this reproduction is given.

THE

ARCHITECTS' JOURNAL

27-29 Tothill Street, Westminster, S.W.1.

Wednesday, September 10, 1924. Volume LX. No. 1549.

"New Methods" of House Building

I tell this tale, which is strictly true,
Just by way of convincing you
How very little, since things were made,
Things have altered in the building trade.

RUDYARD KIPLING.

FOR some months past the air has been overcharged with rumours of new methods and new materials in house building. Claims are put forward—often extravagant claims—as to the enormous reduction in cost that some mysterious new material will introduce, or that will be rendered possible by the use of unskilled labour. We are not proposing to discuss any particular claim or method, but it may be instructive to see where we can best eliminate cost and to what extent new ideas may help in producing an economic house. To the lay mind reduction in cost is almost synonymous with reduction in size, a belief that has unfortunately influenced our politicians, but there can be only one sensible attitude to adopt towards size, and that is to decide what is the smallest size compatible with the health and decent living of the occupants, and having settled this to stick to that size and accommodation. Experience shows that the sizes of the A3 and B3 Addison houses cannot be seriously reduced without undue loss of efficiency, and it must always be remembered that the loss in working efficiency between a room, say, 15 ft. by 12 ft. and one 15 ft. by 11 ft., is far greater proportionately than the saving effected by cutting out one foot run of floor, wall, and ceiling.

Starting, then, with a fixed standard of size, what are the main items of cost in which a reduction can be expected? The first would appear to be transport. It has been found that the cost of transporting bricks from the north of England to the south is as great as that of purchasing the bricks themselves. Transport is an enormous item, and its elimination as far as possible must be one of the first necessities for cheap building. The point need not be laboured, for clearly on a gravel site concrete, whether in blocks or poured into moulds, presents itself as the obvious method of building. In schemes of any size, granted an efficient organization, concrete should find a larger field, not only in walls, but in flooring and roofing, thus saving timber, slates, and tiles.

Proper organization is essential, and it is here that we must learn from the speculative builder who has brought this feature of his work almost to perfection. The stages by which houses are run up, the order in which the gangs of men follow one upon another, the positions where the materials should be dumped, and their distribution and uses form a small science that would be well worthy of a treatise written by an expert. This question of organization is of an importance that cannot be over-estimated, and yet it cannot adequately be included in any statement dealing with a new method of construction or a new use of materials. It is probable, indeed, that if we gave more attention to organization and less to the points more generally insisted upon, we should arrive at material economies without making any other alteration in our present procedure.

Our methods are more influenced than we most of us realize by our damp but relatively warm climate. The 11 in. hollow wall and its concrete equivalent is ideally suited for such conditions, but in Canada it would give inadequate protection against the intense cold. May we not learn something from the Canadian practice of building in "brick veneer"? It consists of a wood house cased in a 4½ in. brick wall, separated by an air space. This method secures the warmth and comfort of the timber house—of which we have heard a good deal—with the weather-proofing qualities of the outer brick wall; at the same time it overcomes the greatest objection to timber—its liability to fire that may spread from house to house. Wherever timber is used dry rot has to be guarded against, and there is a strong likelihood of such houses becoming verminous.

Steel has much to commend it as a building material, but its liability to rust renders a protective coating necessary. Cast-iron, with its greater resistance to rust, might be employed for outside walls, provided that the cost of transport could be kept within economic limits. But metal has always the serious drawback of being cold in winter and hot in summer. One of the most promising suggestions emanated from Bristol. In the type of house known as "the Bristol Chalet," the outer skin consists of corrugated iron tarred and laid with the corrugations horizontally. This could hardly result in a beautiful house, but it might be made quite inoffensive, and few schemes of which one hears seem to possess such possibilities of cheapness.

The cost and scarcity of skilled labour are so well known that there is no need to dwell upon these points, but it is curious that the methods of construction that require least skilled labour in the usual sense of the term, and practically no transport, viz., pisé de terre, cob, and other traditional methods, do not seem to have caught on to any appreciable extent. The reason lies probably in the difficulty of ascertaining whether the soil is suitable for building, of finding men who understand how to use the material, and in the initiative always required to deviate from established practice.

Standardization of plan is, of course, indispensable in any system whereby houses are built by mass production,

but the greatest danger is that local authorities may imagine that there is nothing to do but to select a standard plan, decide how many houses are to be built, and build away. If large schemes are to be anything better than eyesores there must be a reasonable number of standard plans on which to ring the changes. One plan may be enough for a dozen houses, but in a scheme for a hundred houses variety comes of itself if proper attention is paid to amenities. There must be houses for a north aspect, others for a south aspect, there will probably be parlour and non-parlour houses of each kind, and there should be houses suitable for angles and road intersections. Anyone introducing a special method of construction ought, if he wishes for public support, to wed his construction to plans and elevations of a high standard, and to provide sufficient variety in his designs. We have seen too many leaflets describing new methods introducing ludicrously bad Victorian elevations and inefficient plans. The advice and assistance of an architect are in such cases not only valuable but essential if the construction is to be shown off to advantage.

"Long Years a'building"

The extraordinary difference in time taken to erect different kinds of buildings would provide a stimulating subject for philosophical enquiry. It seems to be inevitable that great churches should be long in building. St. Peter's, Rome, took 120 years to build; St. Paul's, 35 years; while the building of the great cathedrals of the mediæval period spread, in most cases, over three or four centuries. To come to modern times, Westminster Cathedral, begun in 1895, is not yet completed in its decoration, and will not be for many years to come. The bare brick fabric alone took eight years to build. Liverpool Cathedral has already been twenty years in building, and little more than a third is up. In this case, of course, allowance has to be made for the war years, during which operations were almost entirely suspended. It is estimated, however, that, even if funds were readily available, the cathedral could not be completed under fifteen or twenty years from the present time—an unduly long period, it would seem, remembering the constructional resources of the modern builder. We can build our great office blocks (provided there are no strikes or lock-outs!) in a few months—our Empire exhibitions in a couple of years. But we like to build our cathedrals slowly. It would be almost indecent to show haste in the building of a temple that is meant to last for eternity. The work must be carefully pondered; every stone meticulously laid; every piece of carving lovingly shaped. The whole thing demands infinite care and infinite patience. To the architect it must be a wearisome experience to watch his conception so slowly evolving. Yet the sense of satisfaction, when the building at last stands complete, must more than compensate for the long years of waiting. For Wren, in his declining years, there was no greater pleasure than the contemplation of his finished masterpiece. Happy is the architect who sees his works complete. Sir Gilbert Scott, unlike so many great architects of the past, is happy in being able confidently to look forward to seeing the completion of his masterpiece during his lifetime.

Stilts, Viaducts, and Neither

Lord Montagu of Beaulieu's picture of the London of the future, with its great highways 200 ft. high carried on arches of 300 ft. span, springing from huge piers, stretching across London far above the highest buildings, with lifts, escalators, and sloping roads winding inside and outside towers up to the top, has a dream-like (or nightmare-like) quality that recalls the fantastic romances of H. G. Wells. Mr. Andrew Taylor is reminded of Jules Verne, but we prefer Wells, for most of Verne's prophecies have come true. We must hope that Lord Montagu will not prove so true a prophet as Verne. Inspired by the example of his lordship, Mr. Taylor himself indulges his imagination a little. "Why not," says he, "a road bridge up the centre of the River Thames, from the docks, say, to Putney or further? It would not interfere with navigation, there would be no property to purchase, no compensation to pay, and it need only be high enough to cross the existing bridges comfortably. It could be made ornamental and pleasing to the eye as it followed the windings of the river in graceful curves . . . at certain points access could be made to both sides of the river, and additional access could even be given from any of the present bridges by easy slopes." This, surely, is a Capulet for a Montagu. But why these half measures? Why not deflect the course of the Thames via the valleys of the southern counties and pave over the entire surface of the present river-bed? We should then possess an east and west highway that would meet all presumptive traffic requirements for at least a century. But perhaps our traffic problems will be solved on less imaginative lines. Mr. Taylor himself suggests, on the south side of the river, the linking up of certain existing wide roads by means of new portions and extensions, to make another wide road for through traffic. What is certain is that more and more this through traffic must be deflected from the congested metropolitan areas. Instead of going through it will have to go around. Also we shall have to create fewer new suburbs and more self-contained satellite townships, capable of employing upon the spot the great bulk of their populations. London's daily influx and exodus of people has already reached unmanageable proportions.

Things Lost—and Found

The lost books of Livy (now reported found) must put new life into the archæologists and all those people who spend their lives digging in the hope of unearthing something lost in a younger world. Pompeii has been recovered; Knossos has been given to us again; and Tutankhamen provides an instance of one of the most popular—though not the greatest—finds of recent years. But what is there still to find? We want to know how the Egyptians built the pyramids—facts, not theories—what the Sphinx stands for; what the hanging gardens of Babylon were really like; and what is the mystery behind Stonehenge. The lost Atlantis brought up again from the ocean depths would start a pilgrimage of architects from all parts of the globe. Shall we ever know anything of these mysteries? Who shall say. "What the Sirens sang," says Sir Thomas Browne in "Urn Burial," "or what name Achilles assumed when he hid himself among women, though puzzling questions, are not beyond all conjecture." But we have had enough of conjecture; we now want evidence. Will this evidence, as the result of much delving, spring suddenly to light like the long-lost books of Livy?

Little-used Routes

What determines the use or neglect of a thoroughfare? A pretty problem, this. Why do you find Fleet Street, the Strand, and Whitehall crowded with traffic at all times of the day, while the Embankment, a much quicker route from east to west, is but little used? How many drivers realize that to get to London Bridge from Parliament Square it is quicker to cross the river and proceed via York Road, Stamford Street, and Southwark Street than to keep on the north side? There is plenty of traffic room on these south-side roads, while those on the north are invariably congested. Perhaps the explanation is that man is a gregarious animal, and dislikes getting away from his fellows. Or, perhaps (pleasant thought, this), London drivers are sensitive to environment and prefer the architectural attractions of the north side of the river to the squalor of the south. Or can it be that they are not too greatly concerned with getting *quickly* from place to place? We must confess to having observed this peculiarity in taxi-drivers. Perhaps it is a characteristic of the whole race of Jehu.

Liverpool Cathedral

SIR G. GILBERT SCOTT, R.A., F.R.I.B.A., Architect

By Professor Lionel B. Budden, M.A., A.R.I.B.A.

So much has been written about Liverpool Cathedral that descriptively the subject might seem to be exhausted. Nevertheless, as a preliminary to appreciating the design and its significance it may be advisable once again briefly to indicate its situation and the disposition of its main elements.

The site chosen for it is beyond question the most effective that the city had to offer. The building stands high upon the western edge of a plateau rising several hundred feet above the river. On its eastern side the site is bounded by an old quarry, now used as a cemetery, and from the wooded cliffs of this great excavation the eastern walls of the cathedral ascend almost sheer. The major axis of the site runs nearly due north and south, so that the building is not truly orientated. At the southern end, on a slightly lower level than the bulk of the main structure, is the Lady Chapel, parallel to the site's principal axis. Above this, and connected with it, is the chancel of the cathedral, with the chapter house at its south-east extremity. After the chancel, farther north, comes the great central space flanked by four transepts, between which, on the east and west sides respectively, occurs a wide entrance porch; over the central space itself a great single tower is to rise. Beyond this group of transepts and tower the nave will extend, in superficial area and mass approximately equal to the chancel. From the south wall of the chancel to the north wall of the narthex the total distance is about 480 ft. The nave and choir alike are each some 140 ft. in length and, including their aisles, slightly under 90 ft. in width. The central space is a square measuring 200 ft. in each direction; its contiguous transepts are also square on plan, their sides measuring 52 ft.

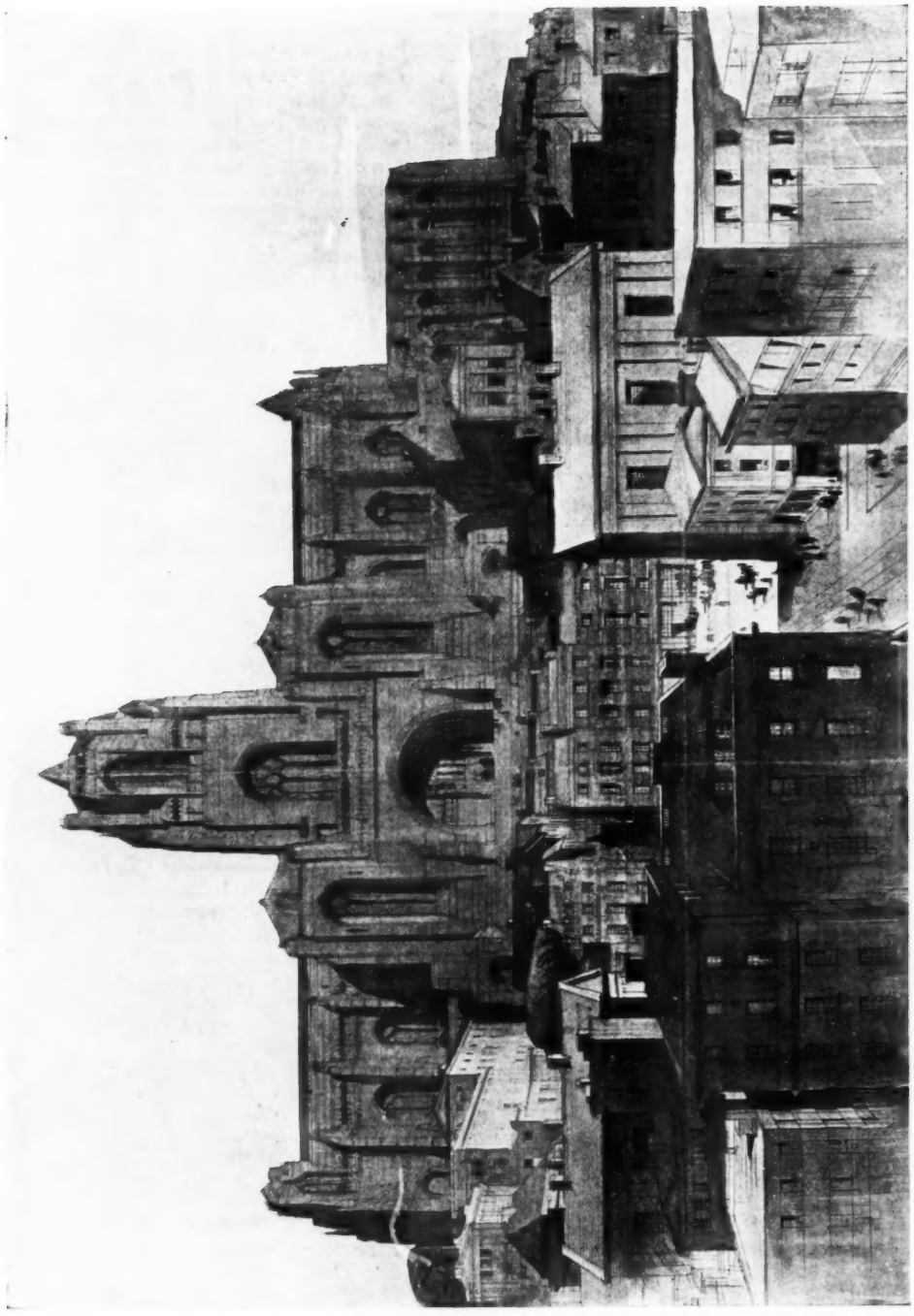
Of the total scheme the portion so far built comprises the Lady Chapel, the chancel, the chapter house, and the two southernmost transepts.

In elevation the design, as it has now been developed, differs considerably from the original scheme. The latter, it will be remembered, contained twin towers placed, not in the traditional manner of French or English cathedrals at the "western" end of the nave, but on the central transverse axis of the plan. A single tower is now to replace these two, and important modifications in the plan have had to be made in consequence. Uninterrupted vistas along the east and west aisles have had to be sacrificed, whilst the vaulting at the junctions respectively of the chancel and nave with the central space has had to be recast in order that a larger floor area should be cleared and the single massive tower have adequate support. To architects trained in other conventions of design, so radical a change in the conception of a scheme might seem to be difficult to reconcile with the maintenance of the remainder. In this case, none the less, it will be admitted that the alteration is likely to be justified in the final result. For the cathedral, as a whole, will be chiefly seen from the river, and from this western aspect a single tower only is required to unify the composition.

As the largest ecclesiastical structure undertaken in England since Bentley's Westminster building, Liverpool Cathedral has naturally aroused more interest, both professional and public, than any other work of our time. It was almost inevitable that its style should be in origin at least what we term Gothic. Though the result of the Victorian battle of styles is supposed to have been a victory for the catholic appreciation of the virtues of every and any style and of their capacities in any direction, the upshot of it all has really been a British compromise. We have agreed to be in the main classical in our secular buildings and mediæval in our religions. And perhaps after all the segregation of these two modes may be justified as logical on the ground that it does faithfully reflect the unresolved relationship of two aspects of our civilization.

The Church of Rome, conscious of its full inheritance, has always been prepared since the Renaissance to permit and even to encourage the erection of its buildings in styles other than Gothic or Romanesque; to that fact we are indebted for the superb interior of Westminster Cathedral. But the Church of England has generally, for the last hundred years at least, regarded the Gothic style as one peculiarly suited to the expression of its aspirations and beliefs; it has invested the English versions of that style with qualities that it regards as more truly national than any to be found in other conventions; it has, in a word, appropriated for its own use a particular manner, and in so doing has been largely followed by the other Protestant sects. Occasionally, where small churches are concerned, an essay in Byzantine or Early Italian may be permitted. Such cases, however, are exceptional. The attitude of the Bishop of London in accepting with complacency the prospect of a wholesale destruction of Wren's city churches is profoundly symptomatic. The whole weight of supreme ecclesiastical authority in England is still on the side of fourteenth- and fifteenth-century architecture.

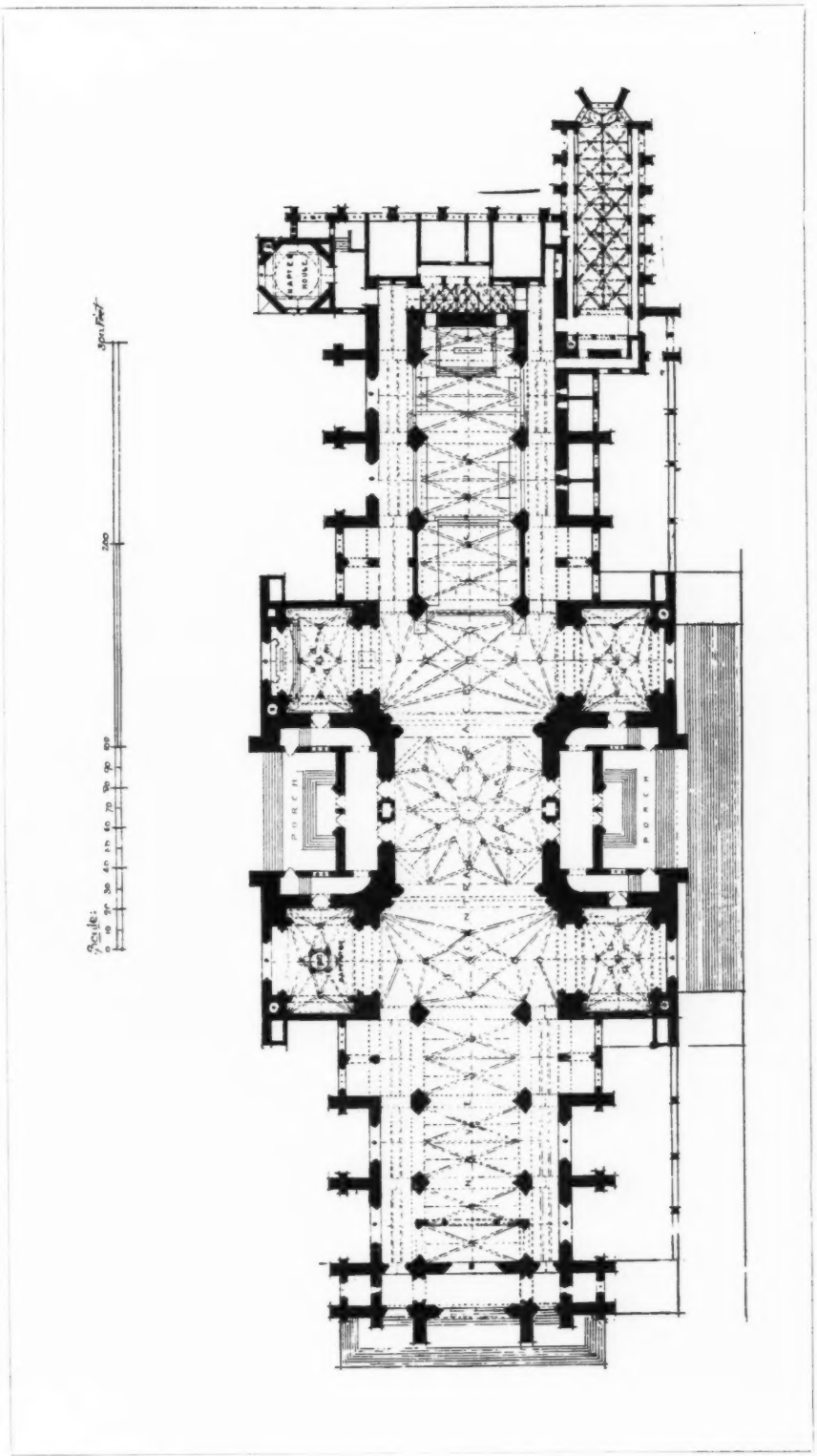
Thus it has happened that when the province of the Gothic Revival had been restricted to ecclesiastical work of moderate size and had virtually withdrawn from the field of great architectural adventure, it now in this remarkable building flames up again as an arresting and possibly portentous phenomenon. Yet though the work must be considered as one that is to be classified with the Gothic Revival, its relation to that movement is about as direct and immediate as the relation of "Greek" Thompson's St. Vincent's Street or Caledonian Road church to the work of the Greek Revival. Here is no replica of an English or French Gothic cathedral, no archæological reproduction of Decorated, Perpendicular or Flamboyant motives, but a composition that is personal and original and without precedent. Considered separately, the elements of which the whole is composed are derived from recognizable sources: this they would necessarily have to be if the work were to be at all intelligible to us. A wide eclecticism, however, and the fusing of influences not hitherto brought together gives a result that is unique. If we take the plan, we find that it contains the great preaching and congregational space commonly found in Renaissance cathedrals; that the nave and choir, though nearly 150 ft. respectively in length, are each divided into only three main bays, the proportions of which are nearly square and recall those of Sta Maria dei Fiore, Florence: and that the minor side chapels of the normal mediæval cathedral plan are entirely eliminated. The structural development of this plan exhibits departures from English traditional practice that are not less noteworthy. The arches of the nave arcade, which are repeated in the choir, rise, as they sometimes do in Spanish Gothic, almost to the level of the springing of the vaulting and thrust the triforium up between the openings of the latter, the clerestory itself being abolished. Laterally, both the nave and choir are lighted by windows in the aisle walls through the openings of the main arcade. This extension of the height of the aisle walls makes them actually the external walls of the building on the east and



LIVERPOOL CATHEDRAL: A PERSPECTIVE OF THE COMPLETE DESIGN

From a drawing by the late Charles Gascoyne.

Note: The design of the tower has since been altered.



A PLAN OF LIVERPOOL CATHEDRAL.

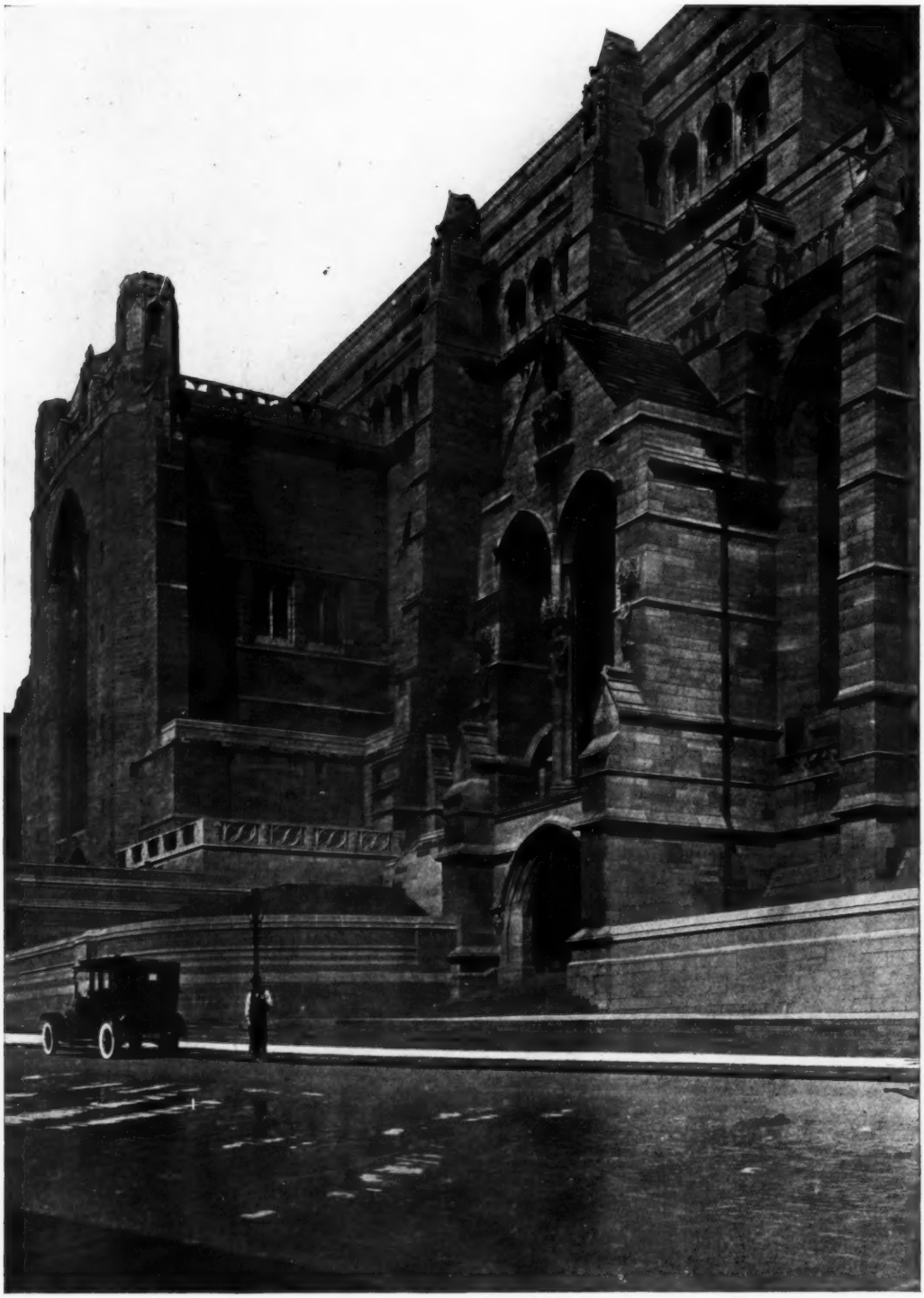
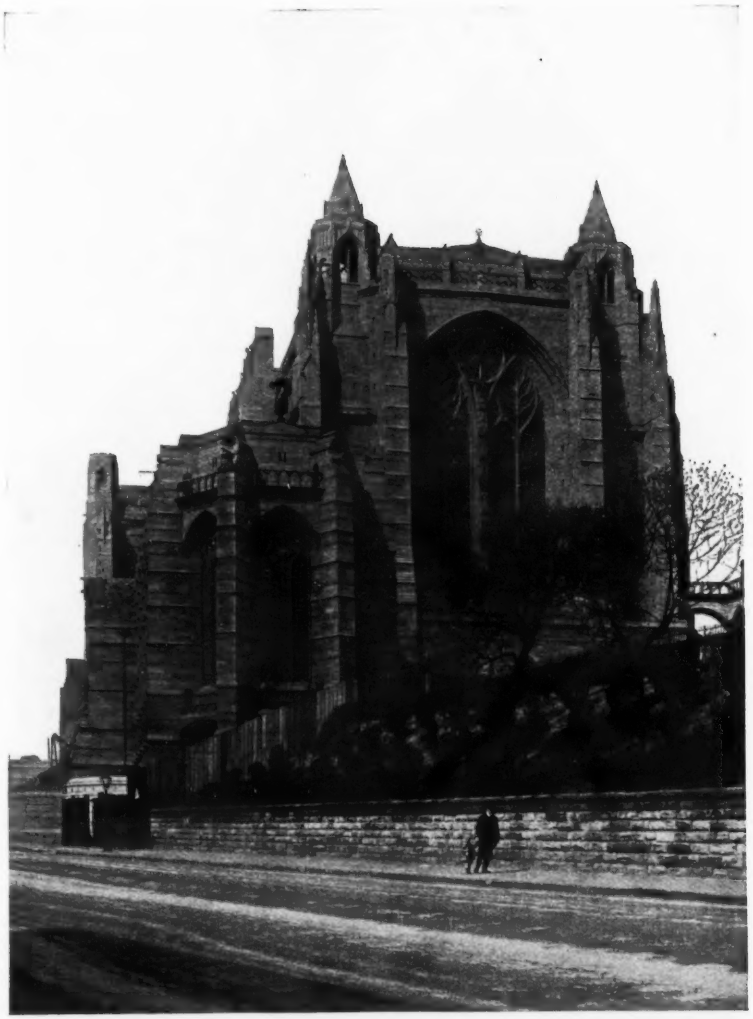
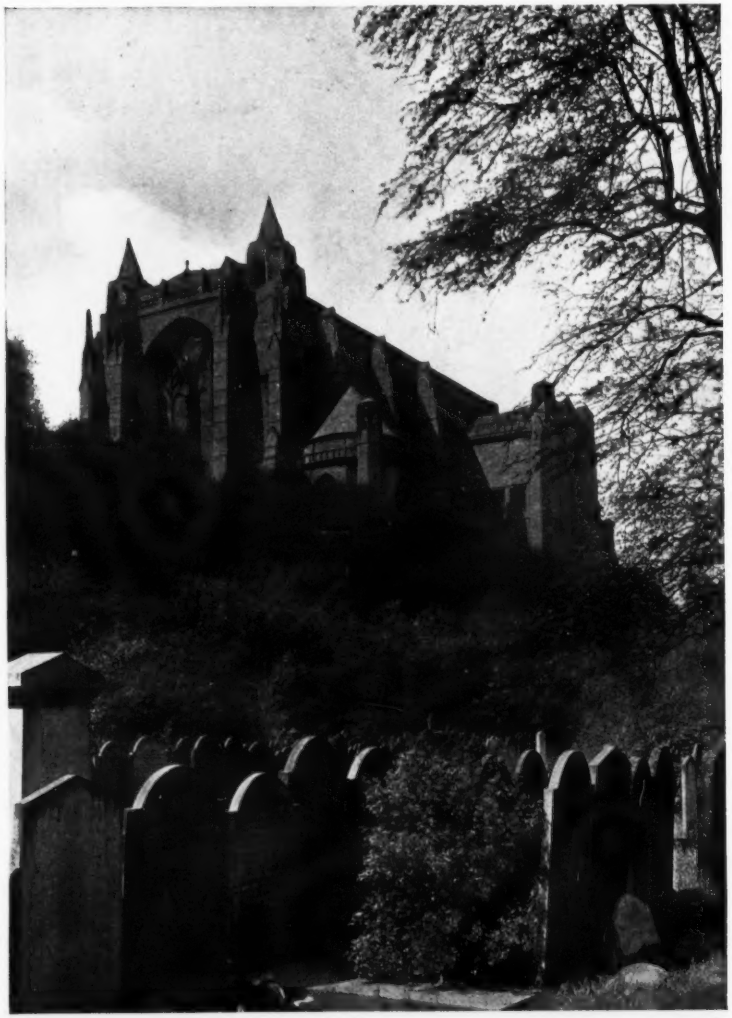


Photo: Stewart Bale

LIVERPOOL CATHEDRAL: CHILDREN'S PORCH AND SOUTH-EAST TRANSEPT



From the road.



Photos: Stewart Bale.

From St. James's Cemetery.

LIVERPOOL CATHEDRAL

Photo: Stewart Bale.

LIVERPOOL CATHEDRAL: THE CHOIR, LOOKING TOWARDS THE REREDOS.

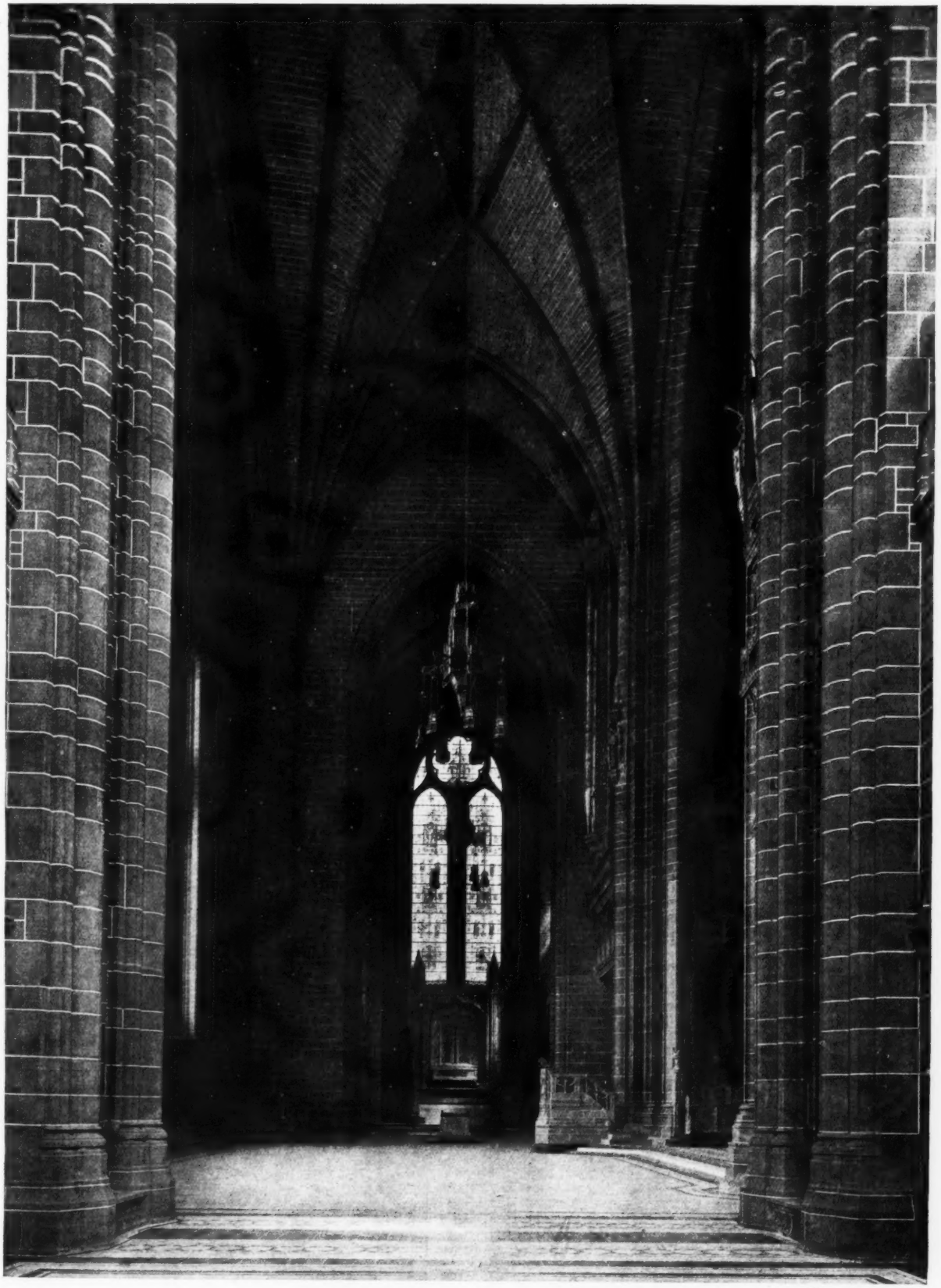


Photo: Stewar Bale

LIVERPOOL CATHEDRAL: A VIEW ACROSS THE TRANSEPTS, LOOKING TOWARDS THE WAR MEMORIAL.

west sides. The flying buttresses which usually mask the flanks of a mediæval cathedral and which always present in perspective an effect of extreme complication are not employed for the support of the vault. Solid and very deep buttresses extend directly from the vault-piers and project beyond the aisle walls so that within the building a series of rectangular recesses is formed and externally the massive solidity of the façade is less broken than it would otherwise be. Clearly, it has been the intention, especially in the exterior, to obtain effects of surface breadth and weight. In mediæval architecture such effects are to be found only in its early Romanesque phase, and in no other respect does the building, either in general design or detail, recall that period.

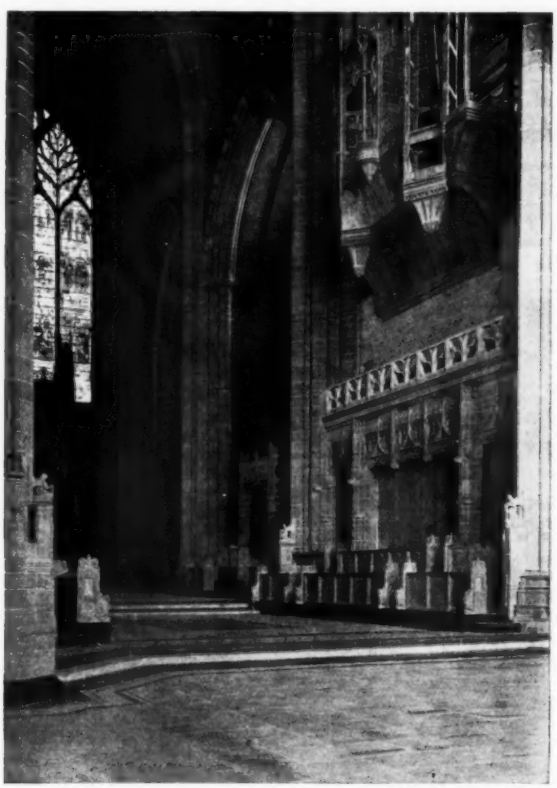
Without pursuing further questions of origins and similarities, it is evident that inspiration has been drawn from many sources. That the work has these traditional references will seem to most of us right and fitting. If ever there were a subject which called for statement in old-established terms, in forms full of known significance and carrying with them a wealth of associations, that subject is a cathedral. To-day an architect may—within reasonable limits—legitimately go much farther afield for his ideas than could his ancestors. A wider range of knowledge is his and the public he serves, so that he cannot sensibly refuse to avail himself of the greater power which this knowledge puts at his disposal. However far the gospel of modernism may influence what is done in domestic, commercial, and civic architecture, it is not likely to have any but a very indirect effect on the development of ecclesiastical building. One cannot conceive an astylistic cathedral satisfactorily enshrining an historical creed. On the other hand, it is equally obvious that a cathedral which ignored the age in which it was built and was merely reproductive in its form could no more be a work of vital art than one of those painstaking performances that were so often the well-intentioned but unhappy products of the Gothic Revival. Both dangers have been avoided at Liverpool. The roots of the building strike deeply into the past, yet what they draw from it is something that may fairly be called new.

Most, if not all, of the mediæval cathedrals have achieved unity of design in their interiors rather than in their exteriors. This has been primarily due to the placing of the dominant vertical feature, the dual mass of the towers, at the western end. Externally, such a building only gives an effect of balance as seen from points opposite that front; viewed laterally the composition has all its weight disposed at one end. There are, of course, exceptions to this rule—Salisbury for one—but in no case has so completely symmetrical a scheme as that proposed for Liverpool been adopted.

From the portion that has been executed it is probably easier to imagine what the whole will be like inside rather than to apprehend the total outward effect of the finished building. For though the elevational appearance of the nave and transepts still to be built will, unless the scheme be further modified, closely echo that of the transept and choir now completed (so that we may anticipate its contribution) the addition of the lofty central tower must, when it comes to be done, make a more dramatic and less calculable difference to the exterior than to the interior. In that third of the latter which now exists we have the most appreciable promise of what is to come.

We should consider first what is the general and predominant impression which is made on those who enter the newly consecrated part of the building. The accusation has been brought against the architects of to-day that, in the spirit and temper of our age, they would see in the programme of a cathedral an architectural rather than a religious opportunity. This attitude has been unfavourably contrasted with that of earlier ages, when religious faith dominated men's minds and the originating inspiration of buildings for the service of that faith was itself religious; when the work of design was a work of piety. Because, it has been said, this condition of affairs no longer holds, the supreme virtue of religious architecture, the authentic fervour which makes possible its finest achievements, has been lost: and, as a result, our modern churches have only as superficial attributes the qualities which should be in the very structure of their fabric.

THE "NORTH" SIDE OF THE CHOIR.



Photos: Stewart Bale.

THE "SOUTH" SIDE OF THE CHOIR.

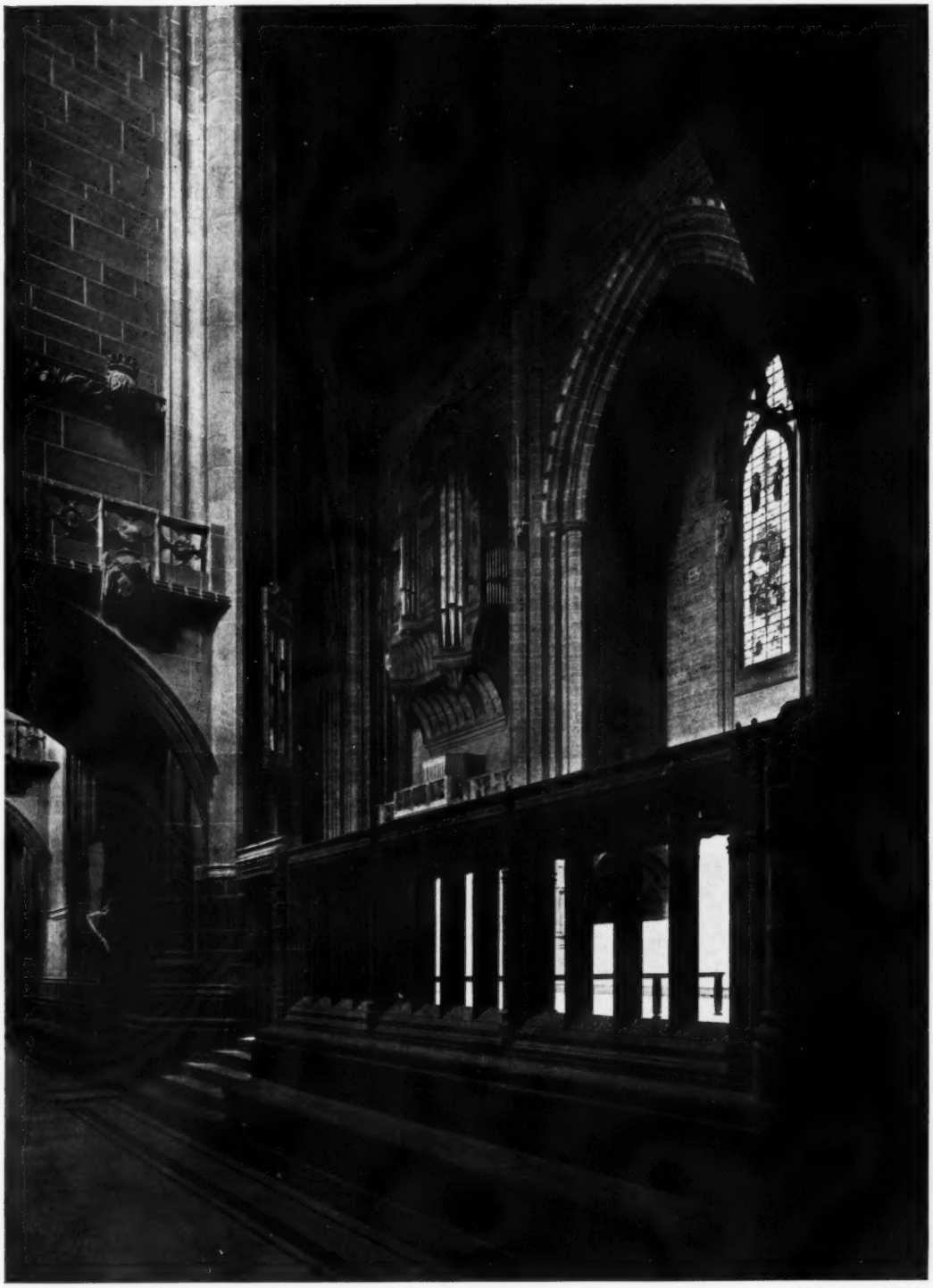


Photo: Stewart Bale.

LIVERPOOL CATHEDRAL: A VIEW FROM THE "SOUTH" CHOIR AISLE.

They are in consequence cold, mechanical, and ineffectual. No such indictment has been preferred against Liverpool Cathedral. It has called forth only tributes distinguished by the most enthusiastic eloquence.

On entering at the north or west end through the temporary brick wall which closes the arch between the transepts, the first impression is one of great spaciousness —of vaulting rising to a loftier height, of a vista longer even than the exterior had promised. Though there is no lack of decorative detail, it is concentrated at specific points rather than equally distributed, and the main lines of the design stand clearly revealed. That multiplicity of parts which gives to most Gothic buildings their effect of intricacy is consistently avoided in the articulation of the major elements of the work: it is reserved for the surface modelling of the minor incidents. Plain wall surfaces and boldly emphasized lines have for the most part been relied upon to produce a sense of power and simplicity.

The climax of the interior is naturally the reredos constructed of the same warm red sandstone as that of the building itself and integrally a part of the south (or east) wall: it extends the full width of the choir and its central portion rises well above the sill of the largest stained-glass window in England. If it could have had a solid backing up to the crown of the vault and have been lighted only from the sides—like the famous reredos of Goodhue's in St. Thomas's church, New York—its elaborate richness would no doubt have told more than it does. But the figures and other portions by being gilded are freed from their background, and the light which passes through the window is subdued by traversing stained glass of greater opacity than any used elsewhere, so that the labour expended upon the carving has not been in vain. Generally, the natural lighting of the interior is graded so that it reaches its maximum intensity in the open space between the transepts. To some extent the result is due to the plain glazing of the openings in the temporary screen wall, but, even if these were closed, there would still be more light at the end nearest to the crossing than by the altar. The tall and slender windows of the transepts have a large ground of silvery glass which admits a flood of brilliant light little interrupted by the colour it encloses. Next to them in the scheme of graduated illumination come the aisle windows on the west and east sides adjacent to the organ bays. In these the plain ground is less than one-third the total area and is a neutral grey rather than silver. Here the coloured portions are in the one case predominantly green and yellow, in the other blue and green. The scale of the motives introduced is also larger. A further increase in the weight of the colour occurs in the remaining aisle windows; the one a heavy red and the other a sienna of equal weight. When we come to the chancel window itself, almost the whole area of glazing is covered by figures closely packed, and the colours of all the other windows are used simultaneously with an effect of greater density of tone.

Equal care has been taken with the artificial illumination of the building. Except for the pendant candelabra that drop from the vaulting of the transepts, electric flood lighting has been adopted throughout. The dramatic possibilities of this device have been fully realized. Secreted in the inner angles of pier shafts, behind mouldings and under canopies, the sources of a diffused radiance have been most judiciously placed.

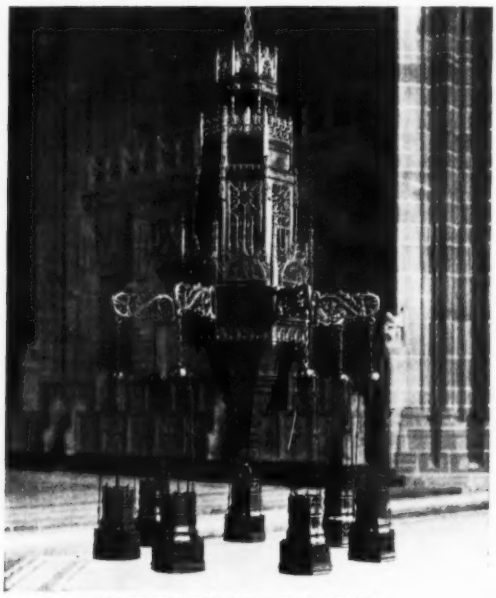
A building of this size comprises far too many elements

Photo: Stewart Bale.

THE CHOIR STALLS.

Photo: Stewart Bale.

LIVERPOOL CATHEDRAL: A DETAIL OF THE CHOIR STALLS.



AN ELECTRIC LIGHT FITTING.

of interest for it to be possible to mention, much less adequately discuss, all of them within practicable limits. Only some of its most obvious aspects can be noted and, for the rest, the structures ancillary to it, and such subsidiary features as the tracery of the windows, the patterning of the vault and of the floor, the bishop's throne, the war memorial—in which the sarcophagus motive of an Early Italian wall monument as well as other classical details are enclosed within a Gothic frame—the organ, the furniture, and the carving in stone and wood must be left to tell their own story in illustration.

No other architectural work erected in the present century has been so generally praised. Already it has influenced the taste and affected the standards of English architects. And the question inevitably suggests itself to us: Is Liverpool Cathedral to be the cause of a new manner in our national architecture? One may prophesy with some confidence that Sir Giles Gilbert Scott will have imitators: and, with Mr. Goodhart Rendel discovering unexpected and hitherto unrecognized virtues in the Gothic Revival, anything may happen. But that a manner so essentially personal should form the basis of a common convention must seem improbable even to those who value it most highly. That, however, is an abstract and not directly relevant question. It is the appreciation of the Cathedral as far as it has been built that must immediately concern us. Recently Sir Giles Gilbert Scott in commenting upon current practice has said that too many of our modern buildings were the product of thought rather than of emotion. To some people this excess of intellectuality in contemporary British architecture may not have been apparent. Nevertheless, the criticism is significant because it shows how the author of Liverpool Cathedral would wish us to experience the appeal of his work.

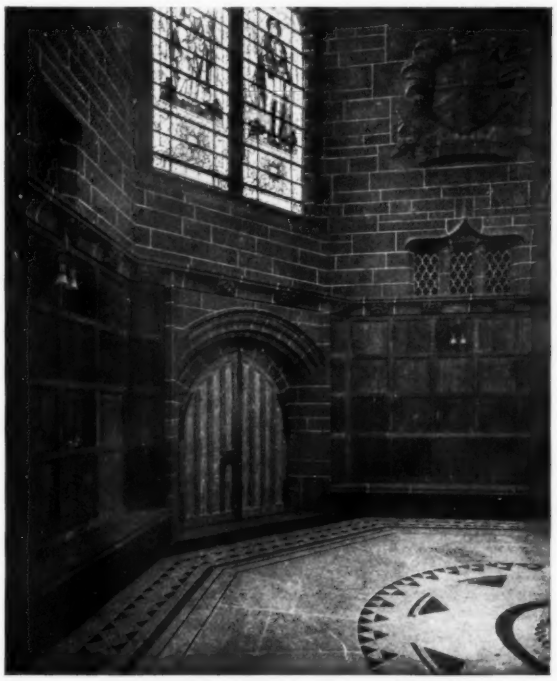
L. B. B.

In the official handbook of the Cathedral, the fourth edition of which has just been issued, it is stated that no question is more often asked with reference to the cathedral than "When will it be finished?" and no question is more difficult to answer. The present section has taken twenty years to build, and as there are at least three more sections, viz., central space (with the western transepts), nave, and tower to be completed, there would seem justification for those who consider that at least a further fifty or sixty years must elapse before the last stone is placed in position. Against this it can be urged that, during the four years 1917–1920, little more than maintenance work was done on the site, and also that the portion already built is far more complex and therefore took far longer to build than the remaining sections are likely to do. The next section to be undertaken, the great central space and two western transepts can, it is estimated, be built in six to seven years, and if sufficient funds were then available, the nave and tower could subsequently be completed in approximately the same time. Everything naturally depends on whether financial support in the future is forthcoming on the same generous scale as in the past; but from a constructional point of view there is nothing to prevent the cathedral being finished in fifteen to twenty years from the present time.

The great tower has recently been re-designed and as now proposed will have a height of some 357 ft. above St. James's Road. The principal features are the great louvres and the boldly modelled upper stage which is octagonal on plan with delicate supporting pinnacles at each corner. The great windows of the central space have also been re-designed, wheel tracery being introduced above the lancets.

Following are the principal dimensions of the cathedral. Heights are measured from floor level (which is 158 ft. above sea level), and other measurements taken between walls, or from arch centre to arch centre:—

Exterior Measurements.	Feet.
Length of main building (excluding buttresses)	558
The lady chapel projects a further	61
Making a total over-all length	619
Height of central tower	342
(N.B.—The height given here is above floor level; the total height above St. James's Road is 357 ft.)	
Height of main roof	138
Interior Measurements.	
Length of nave (including narthex)	143
Length of central space	201
Length of choir	138
Total length from west door to reredos	482
Length of lady chapel (including space below gallery, but excluding the atrium)	120
Width across transepts (the transepts are 52 feet square)	197



Photos: Stewart Bale.

THE CHAPTER HOUSE.

	Ft.
Width across choir and choir aisles, and nave and nave aisles	87
Width of aisles	13½
Width of lady chapel	33½
Height of choir vault	116
Height of vault to central space	167
Height of lady chapel vault	58

If comparison is made between the above figures and those of other cathedrals, the fact that the central space, though not in name, forms part of the nave should be taken into account.

The handbook has been compiled by Vere E. Cotton, O.B.E., and is illustrated with twenty-nine views of the cathedral. It is published for the Liverpool Cathedral Committee by Littlebury Bros., 3 Crosshall Street, Liverpool, at 1s. net.

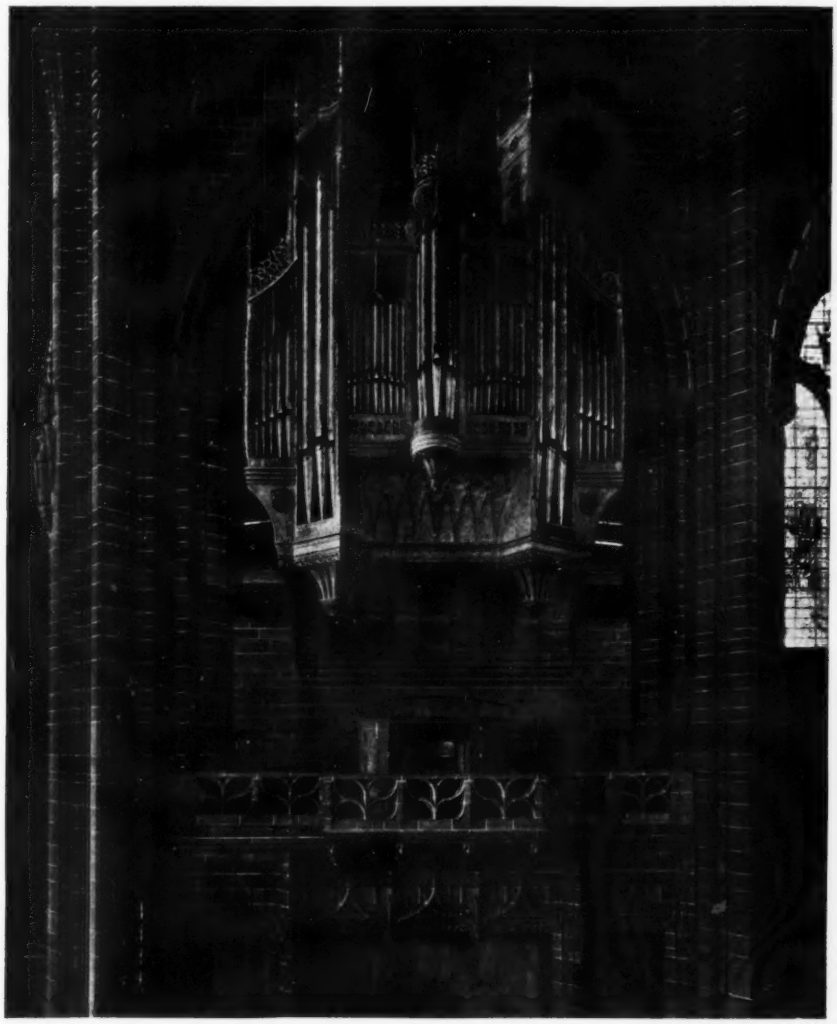


Photo: Stewart Tate.

THE ORGAN CASE.

The Committee hope that it may be possible to proceed at once with the erection of, at any rate, the great central space under the tower (to an interior height of 170 ft.) with the western transepts adjoining it. It is estimated that these will cost, approximately, £300,000, in addition to the funds which the Committee have in hand, and for this an appeal is now made. The sum named will not cover the cost of the tower above the great central space, or of the nave beyond the western transepts.

The general contractors for the building and foundations were Morrison and Sons, Ltd., Liverpool, and the sub-contractors were as follows: G. N. Haden and Sons, Ltd., Trowbridge (heating, ventilating, and fire protection); John Stubbs and Sons, Liverpool (marble flooring and terrazzo work); Farmer and Brindley, Ltd., London (marble work other than flooring); John Hunter & Co., Liverpool (responsible for the complete lighting and power installation—sub-contractors to Messrs. John Hunter & Co., The British Thomson - Houston Company, and Messrs. F. and C. Osler, Ltd., London and Birmingham); The Limmer and Trinidad Lake Asphalt Co., Ltd., London (asphalting). The general contractors, Messrs. Morrison and Sons, Ltd., were responsible for all woodwork except the choir stalls. These were made to the order of the donor by Waring and Gillow, Ltd., Liverpool; Henry Willis and Sons and Lewis & Co., Ltd., London (organ builders); Mears and Stainbank, London (bell founders); James Powell and Sons (Whitefriars), Ltd., London (the whole of the stained glass in the choir, transepts, aisles, and lady chapel); Morris & Co., London (chapter house windows); Burlison and Grylls, London (ambulatory windows); C. E. Kempe & Co., Ltd., London (chapter house staircase windows); Bromsgrove Guild, Worcester (bronze choir gates and reading desk on lectern); Walter Gilbert, Birmingham (communion rails and bronze work on memorial reredos and cenotaph); W. Bainbridge Reynolds, Ltd., London (silver ornaments, door furniture, bronze grilles, and electric light fittings to the lady chapel); Watts & Co., Ltd., London (embroidery mounting); G. Tosi, London (gilding and decorating).

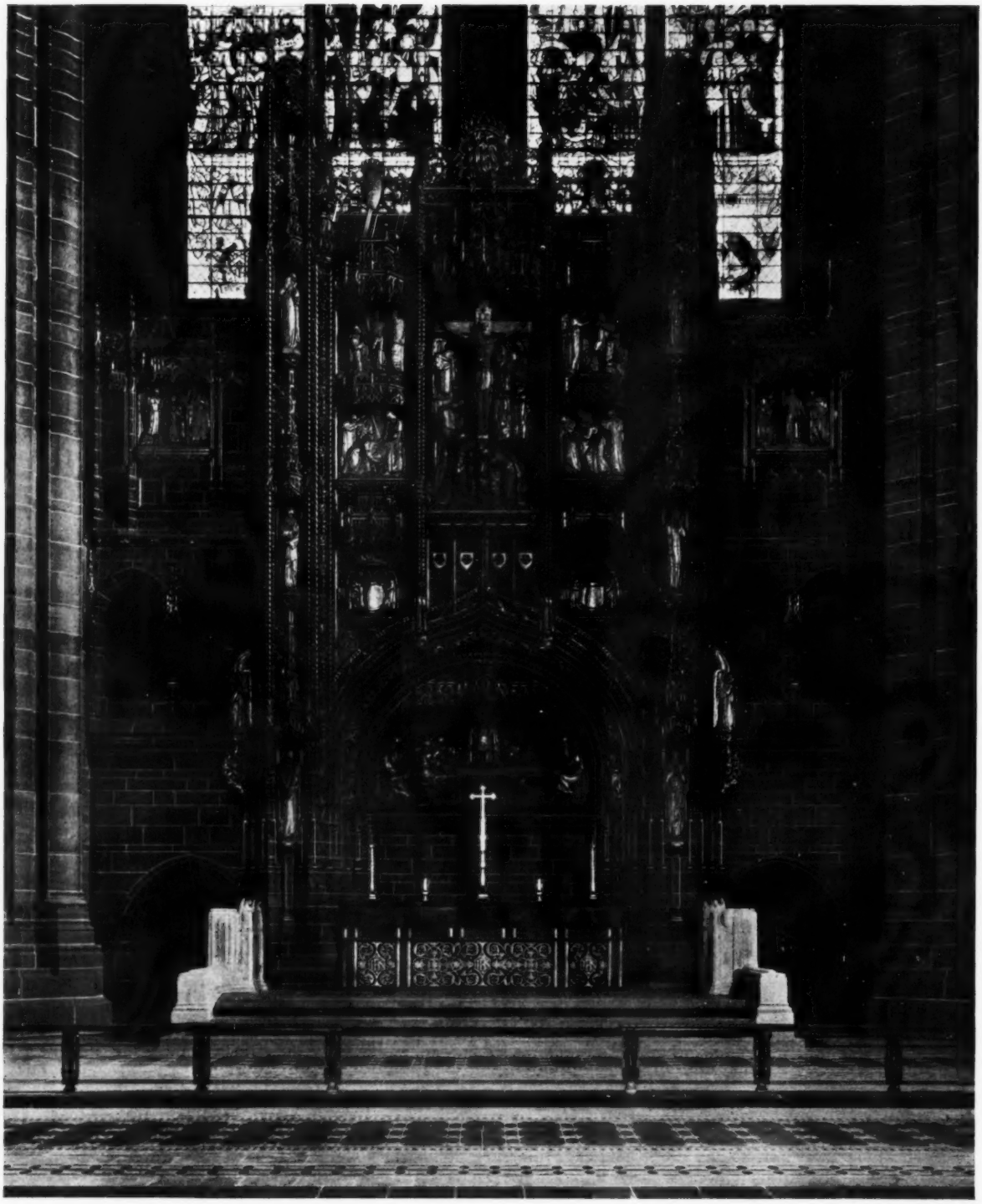


Photo: Stewart Bale.

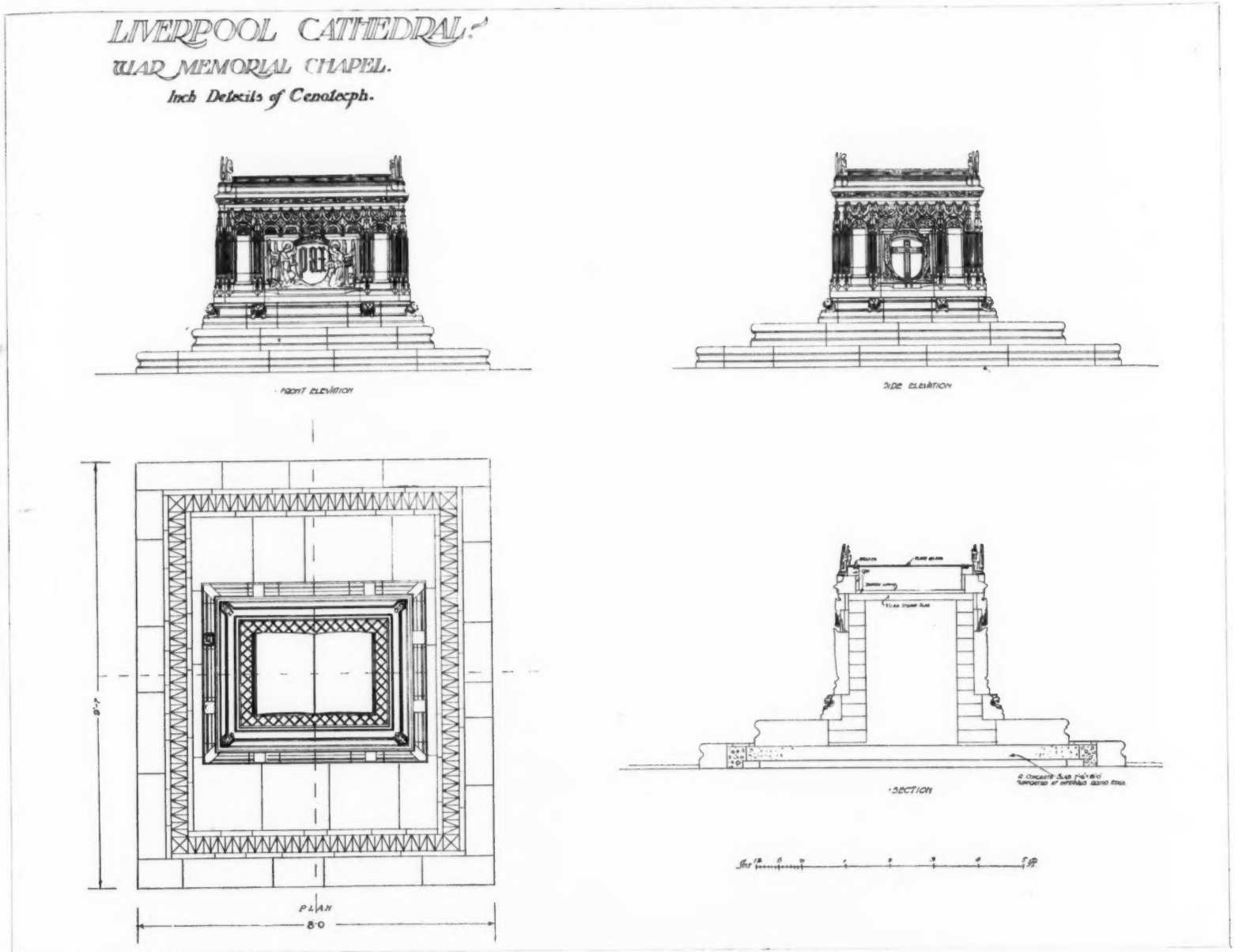
LIVERPOOL CATHEDRAL: THE REREDOS.

The VIIth and the Xth Commandments.

The VIIIth and the IXth Commandments.

The Last Supper.

SOME DETAILS OF THE REREDOS.

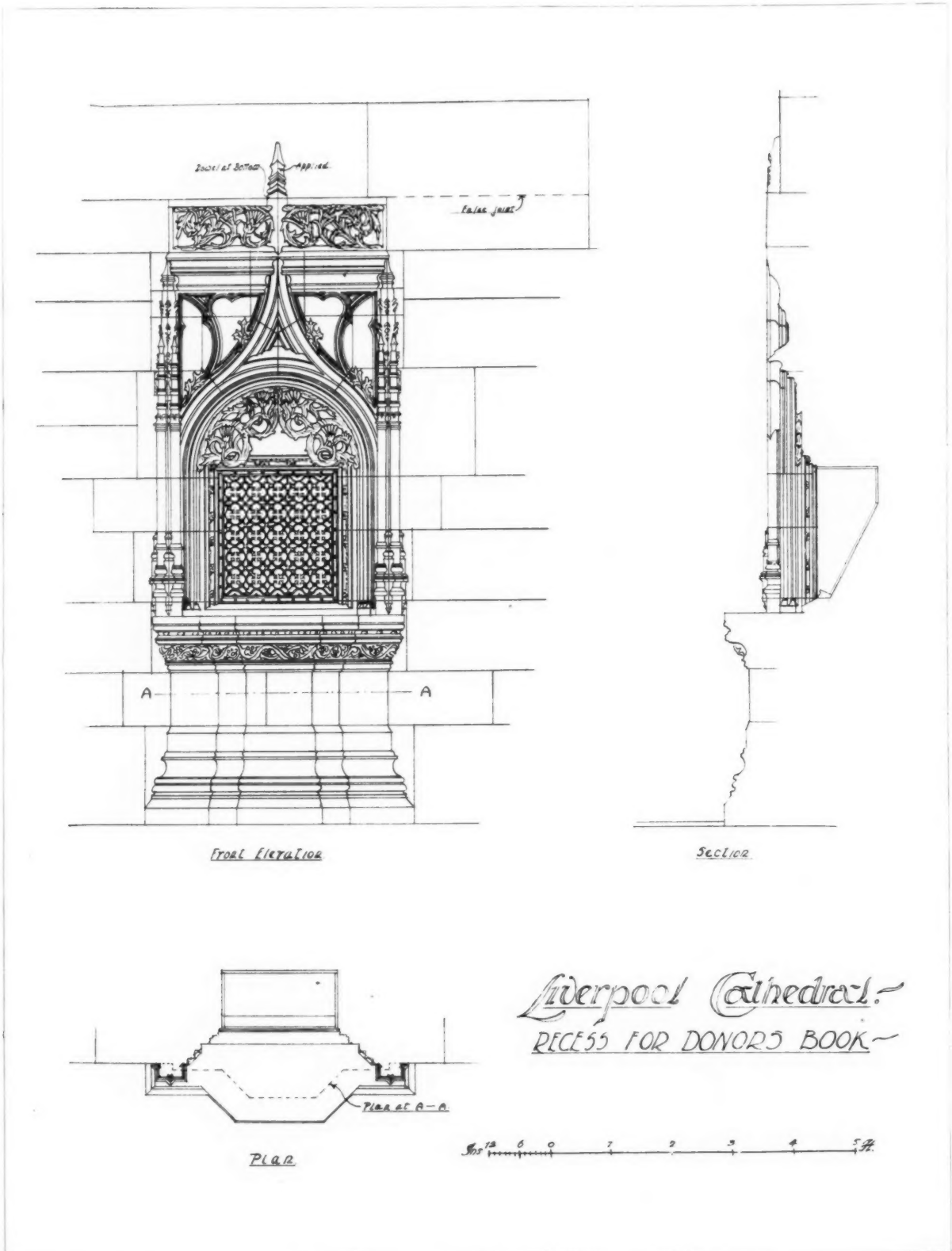


A WORKING DRAWING OF THE CENOTAPH IN THE WAR MEMORIAL CHAPEL.

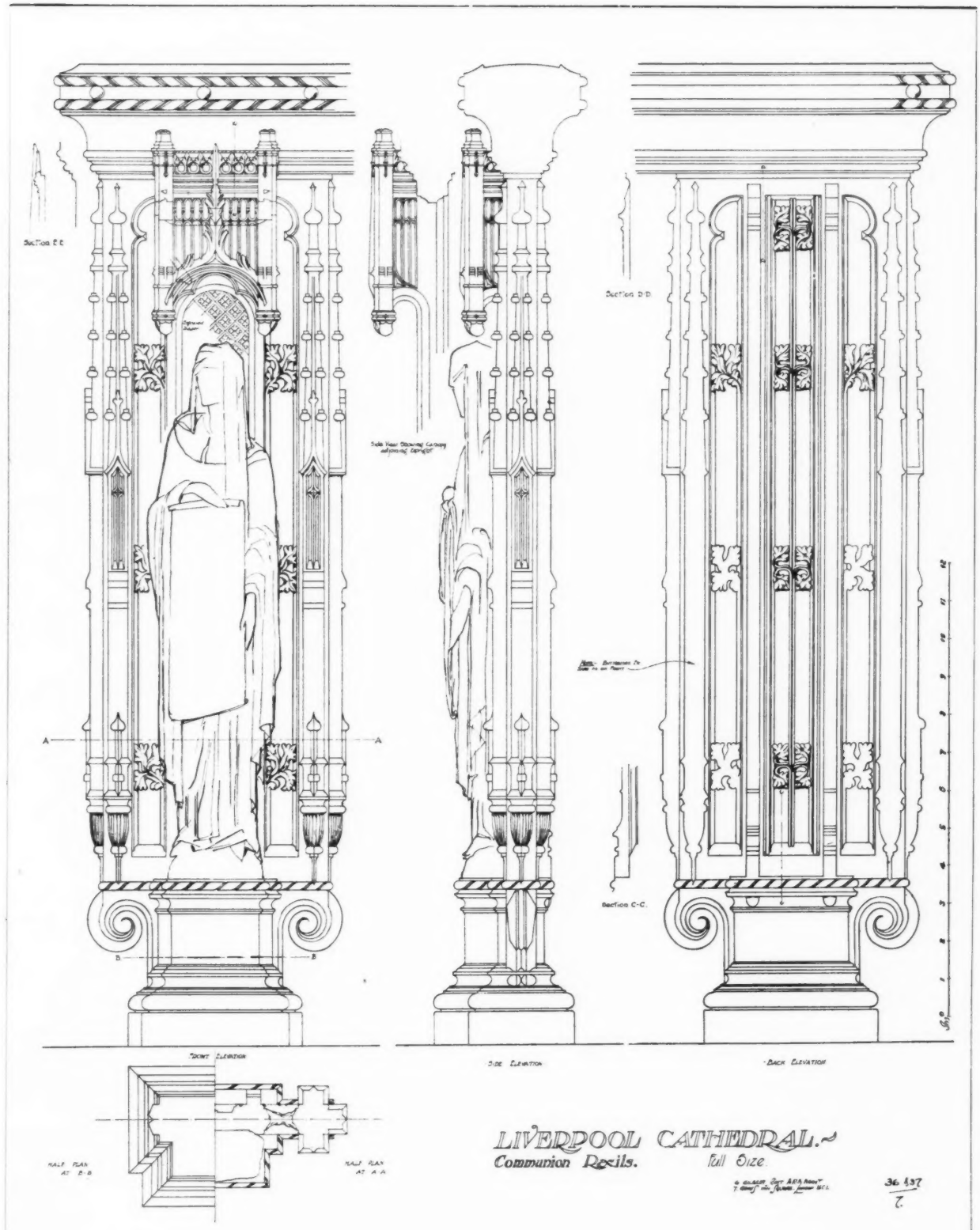
Photo: Stewart Bale.

THE CENOTAPH IN THE WAR MEMORIAL CHAPEL

A WORKING DRAWING OF THE CENOTAPH IN THE WAR MEMORIAL CHAPEL.



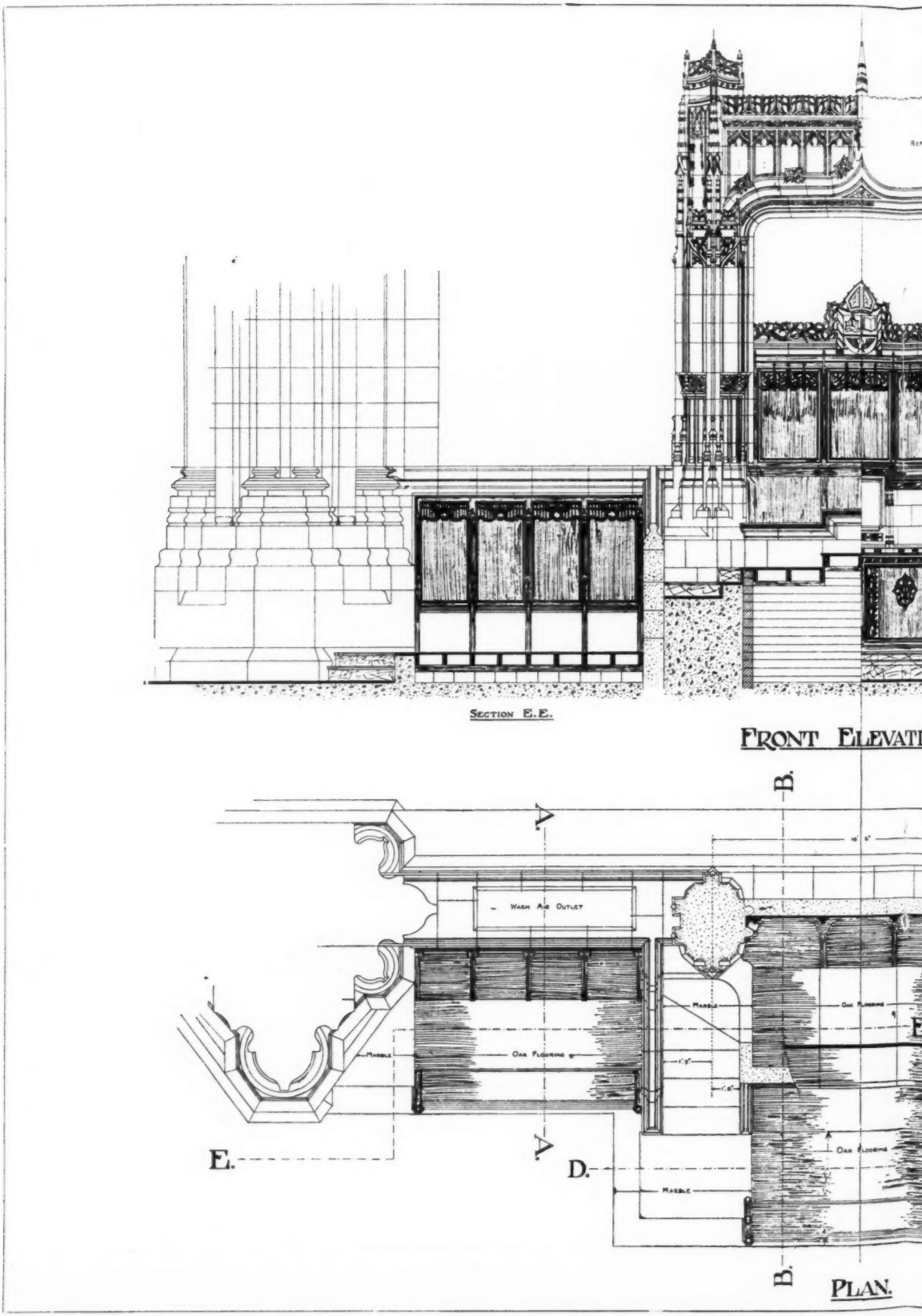
LIVERPOOL CATHEDRAL: A WORKING DRAWING.



LIVERPOOL CATHEDRAL: A WORKING DRAWING.

Architects' Working Drawings. 84.—Live

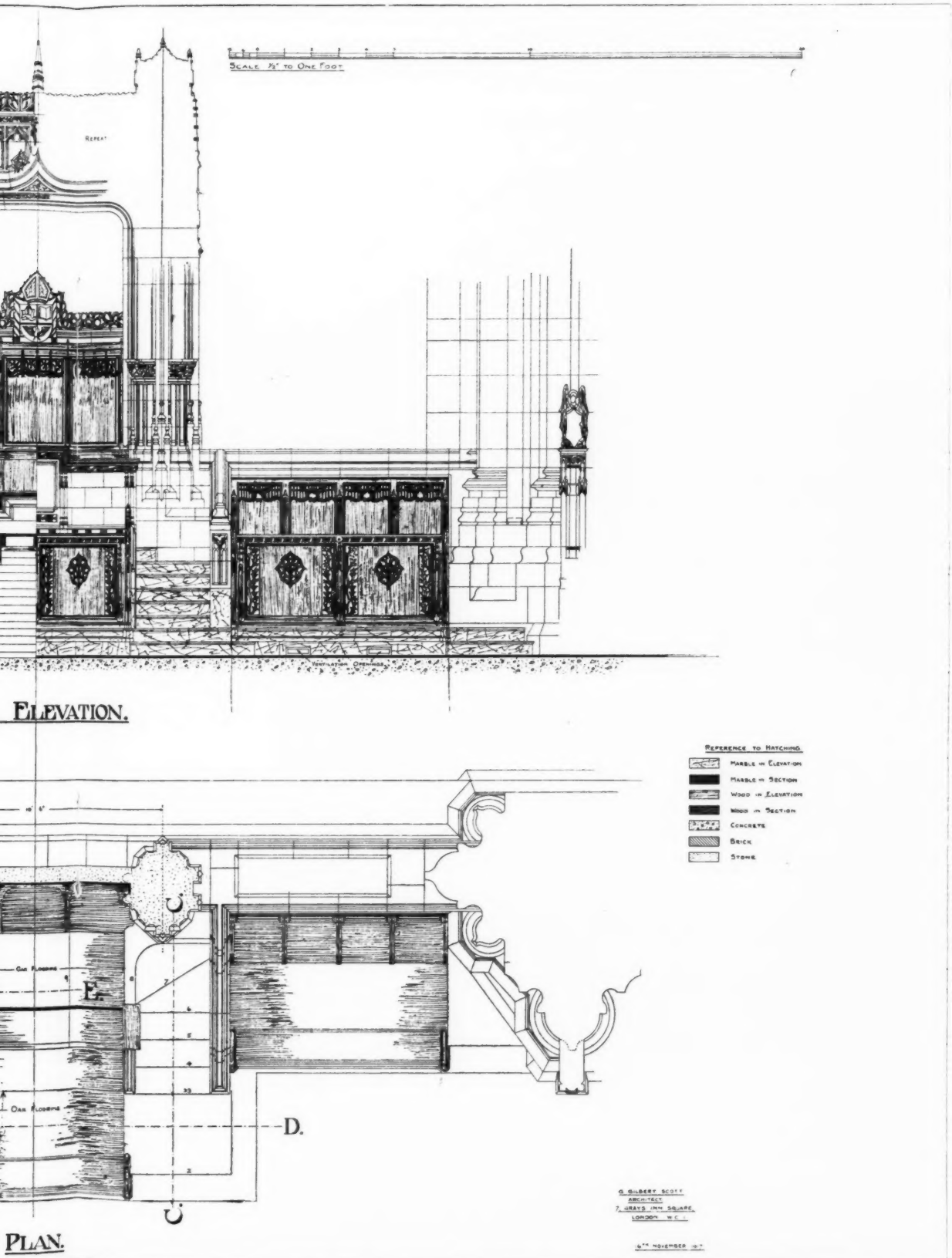
Sir G. Gilbert Scott, R.A.



The Bishop's Throne occupies the middle bay

84.—Liverpool Cathedral : The Bishop's Throne

Scott, R.A., F.R.I.B.A., Architect



the middle bay of the choir arcade on the "south" side.

Contemporary Art

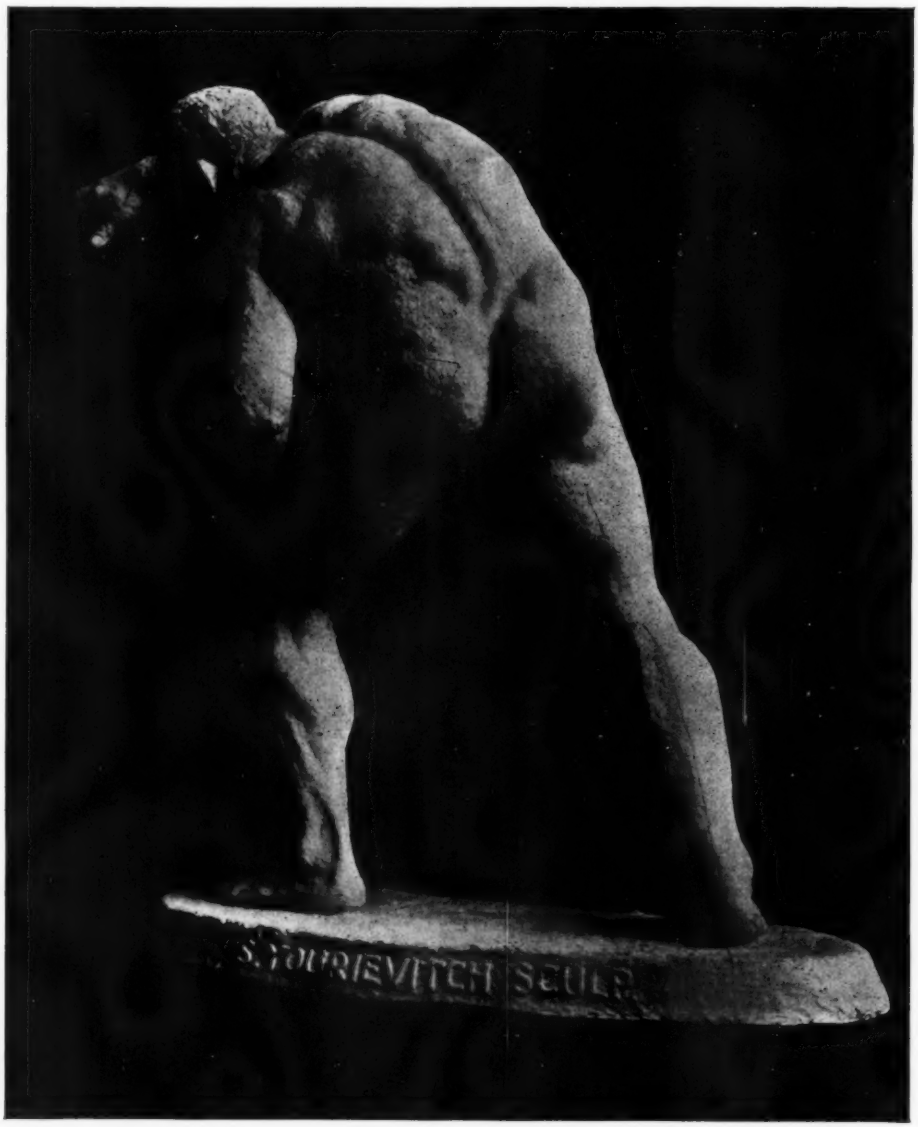
Renaissance Small Sculpture.

Among recent acquisitions to the Victoria and Albert Museum are some half-dozen pieces of interesting sculpture. Two of them are carved in boxwood : a nude statuette of a man, of Italian or German workmanship of the sixteenth or early seventeenth century displaying some fine workmanship, and a Diana and Hound by Leonhard Kern (1588–1663), German, smoothly carved in full rounded form. Another piece of the sixteenth or seventeenth century, probably Italian, is a statuette in sycamore, which displays good action and careful anatomical study. Still another of similar origin and period is a group in pine of Two Boys Quarrelling, a vigorously modelled piece derived from the recently dispersed Rosenheim Collection. A Mask of a Boy carved in porphyry is possibly by the Florentine sculptor Francesco del Taddu, who was at work for the first three-quarters of the sixteenth century. A valuable piece of architectural work is a Virgin and Child, of Sienese workmanship, and perhaps at one time in the church of the Incoronata at Naples. This is carved in marble in very low relief with delicate feeling, the Holy Woman having a very sweet expression.

In studying such objects of plastic art it becomes clear that, failing a new inspiration, the young sculptors now forming a school at Florence are well advised in following in this tradition. Recently, as a result of a competition, the Pietà destined for Santa Croce in Florence, by Libero Andreotti, has been selected as a memorial to Italian Motherhood, not without dissent, however, from the friends of Antonio Maraini and Romano Romanelli, and three other participants in the final selection of the six models.

Egyptian Architectural Decoration.

Truer sculpture—inasmuch as sculpture is the handmaiden of architecture in its primary application—was to be seen at the interesting exhibition of antiquities from Tell-el-Amarna, the fruits of the excavations of the Egypt



"THE WRESTLER." SERGE YOURIEVITCH, SCULPTOR.

(From the plaster cast.)

Exploration Society, 1923-24, shown at the Society of Antiquaries. The sculptured, that is to say, carved, mangers of stone with figures of antelope, ibex, and oxen feeding are indications of the degree of civilization reached by the year 1370 B.C. in the city raised by Akhenaten, while the moulds for jewellery and other luxuries tell of the life of the richer inhabitants. Not only incised sculpture adorns the buildings, but frescoes are represented with painted figures of great excellence of form and colour. Isolated sculpture was not neglected, however, for there were exhibited statues in limestone, heads and hands, and a number in wood.

Modelling of figures was pursued with vigour, as was to be seen from the fragments of the clay monkeys and other specimens, while modelling for pottery was raised to a high stage; the examples of faience and the actual moulds being of a striking character, and much of it was decorated in coloured patterns and naturalistic representations. Beads of glass and faience, lettered inscriptions, and bronze bowls were among the miscellaneous objects of this exhibition, which included drawings and plans reconstructed from the ruins of the royal palace, houses, stables, and workshops.

A Russian Sculptor.

Serge Yourievitch is holding an exhibition at Crown Chambers, 9 Regent Street, of some of the modelled works he recently exhibited at the Galerie Barbazanges in Paris. He was a friend of Rodin, and of M. Léon Bourgeois, and in association with the latter founded the General Institute of Psychology. These two factors have served to determine the direction of his work, for he is undoubtedly a realist and a psychologist. He strives for exact representation and succeeds in attaining it in such examples as his over-life-size nude Wrestler and the nude statue of the dancer, Nattova, bought by the City of Paris, in which anatomical realism and vigour of action are the main-springs, while his portrait busts of Beethoven, and M. Emile Boutroux, of the Academy in the Luxembourg, display his analytical powers. A well-known work of his also in the Luxembourg, is the group "The Golden Calf." Yourievitch works very carefully from living models all the time, indeed, carrying Rodin's doctrine further than the master, losing in the process some of the imagination with which he might have endowed his works. His aim, however, is the plain, stark truth, and this he offers in veritable versions of real life.

KINETON PARKES.

The Case Against Railway Advertising

By E. MAXWELL FRY, B.Arch., A.R.I.B.A.

ONE does not like to criticize, in face of that liberal gesture of some of the companies, the advertising policies of our amalgamated railway systems, but it seems desirable to make a clear statement of the position at this moment—when new constitutions are being drawn up—before crystallization sets in.

It cannot be maintained by even the most economically minded that the be-plastered walls of our stations make for good and profitable advertising, or that they have helped towards either the amenities or the efficiency of these stations. They have not in fact, for, more than anything else, they have given that note of disorder and untidiness that makes an English station unmistakable anywhere. Buildings will grow old, and alterations must complicate the once simple arrangements of a bygone day, but when some "revenue-thirsty" official is allowed to roam at will over every inch of railway property with paste and brightly coloured paper, then there is an end to the last semblance of order, and chaos reigns.

The plea that such advertising is an amenity, and, mark it, a revenue-producing amenity, is good only for such spaces that lack sufficient interest by themselves, but these spaces are limited in area, and for the railway company to assume that the public is unable to stand the strain of efficiency and order unadorned, leaves them with the single excuse, namely, that they cannot afford to lose the rents from advertising sites.

No one will deny them the right to benefit by such rents, but there is a just case against them when the very purposes and objects of stations, with all their sub-divisions of waiting-rooms and booking halls, are stultified and made hideous by an unregulated and jostling exhibition of ancient and modern advertising. It does not happen so in America or Germany—two exceedingly efficient countries.

In America the railway companies feel that their service to the community gives them a certain dignity, which they maintain in such masterpieces of architecture and order as the Grand Central, New York, or the Union Station, Washington.

Suppose one takes, for purposes of arriving at the allowable area of wall surface for poster, etc., display, a medium-sized terminal station in a medium-sized town.

There will be first some sort of approach or station square. This is known in the railway under the term "cab yard," thus explaining in two words a point of view. As this square is the foreground to the entrance front of the station it would be a mistake to line its sides with posters, and even more a mistake to hide the architecture of the building under layers of paper and sheet iron.

Both these things are done so as, at times, to disguise all character and meaning.

Generally speaking, railway companies have tried to build well, often with success, but too often they have thrown away the thousands of pounds spent on bricks and stones and architects and workmen by carelessly concealing their work with garish posters. It is a moot point whether there is any necessity for posters on the station front at all. I think not. There are booking halls near at hand, for time tables and the like, and the entrance front should be kept free from anything likely to cheapen a good effect.

Inside, the booking hall is the most important room, and there it is necessary to display in easily legible positions the necessary time-tables and notices, together with one or two legal notices that must be provided for such public places. If there is any attempt to give to this public hall a dignified architectural setting, then the number of announcements should be limited to the few that are necessary, and these should be arranged in harmony with the general scheme.

From the booking hall one steps on to the concourse or directly on to the platform, and in either of these two places the railway advertising manager is on his rightful ground, but again, he must obey the rules of decency, and control a desire to deck the place like a May-horse. There are time tables, announcements, notices, railway and other posters, and for each of these things there is a place.

Now that the underground have shown that the advertising world is alive to the benefits that accrue from ordered display and standardized posters, there should be no difficulty at all in arranging to the mutual benefit of the railway and the advertiser an efficient and well-planned display. A careless agglomeration lessens the individual value of sites; selected positions are worth double and treble the value of unregulated spaces, while by leading the eye away from structural deformities or masking the nakedness of steel they may perform a real benefit to the station.

The limited publicity of the waiting and other rooms leaves them immune from the worst types of advertisers' rash, and so long as there is more wall surface than poster one may have occasion to rejoice.

From such brief review as this, one recognizes a malady and can prescribe a remedy, but at the present stage the railways are bound by concessions and contracts to maintain the same area of display, and the task of re-arrangement is a great one, but there is no excuse for the maintenance of so blind a policy in the stations that are to be erected or reconstructed under the amalgamation schemes. These should be models of what a generation that specializes in good advertising can do.

No sensible man who puts up a good building that is a worthy advertisement of his commercial standing and security would think of scraping a few extra pounds a year by letting his wall surfaces for miscellaneous advertising display, and it is equally illogical for the railway companies to turn their halls and entrance fronts, that have been designed at much expense for the benefit of their patrons, the public, into common hoardings.

We expect something better of them, and now that a clean slate is presented to them, we do not hesitate to point the moral.

Correspondence

Modernity in Design

To the Editor of THE ARCHITECTS' JOURNAL.

SIR,—Mr. A. Trystan Edwards's love of purism is, this time, well served, and I really enjoyed the fun he poked at my simile, for he has done it neatly.

I also admired the astuteness—and caution—of his wording. Though he has enough skill to imply, in so few sentences, that modernism invites his suspicion—that not only its aggravation, but its very spirit tantalizes him to disparage it—he is too downy a bird to peck at it too overtly.

GORDON H. G. HOLT.

To the Editor of THE ARCHITECTS' JOURNAL.

SIR,—Mr. Trystan Edwards, with his facile pen, has written a note, amusing, no doubt, but all the same a little baffling.

I had read, the previous week, Mr. Gordon Holt's leading article on "Modernity in Design." It struck me as being very sensible and an endeavour—still rare these days—to bring out the unassailable logic on which contemporary architecture should be based.

English architecture is not so sound that attempts at finding what is wrong, and attempts at seeking the principles which would make it right, should be so bantered with. Therefore, one wonders what is the object of such a letter. If mere fun, it is in dubious taste; if, on the other hand, it indirectly conceals the dislike of an avowed traditionalist, then it is rendering a poor service to the cause of architecture. This kind of fun will not settle the unresolved duality between traditionalism and modernity, and the odds, despite such sly attempts, are still in favour of the last settling it in the near future.

WYNDHAM ROBERTSON.

Manchester.

The Building Industry

To the Editor of THE ARCHITECTS' JOURNAL.

SIR,—I observe that the writer of your articles has done me the honour to take note of my letter which you were good enough to publish in your issue of August 27.

Disinclination to trespass upon you again at any great length restrains me from replying in detail to the criticisms of my opinions, in the somewhat distorted form in which your writer now presents them.

By his acceptance of my admonition for his charges against the employers' organizations, and of my views expressed on the main issue, your writer is taken to agree that, after all, the federated employers are not such a bad lot, their work and its results are not so negative, and their spirit not so antiquated and inhuman, as he appeared to believe.

This being so, any doubts which may have arisen in the minds of your readers will be dispelled, and the purpose of my effort achieved.

It is unfortunate that in your brief summary of the settlement of the terms of the dispute, appearing on page 330 of your journal, you have, in common with many other publications, given an entirely wrong impression as to the summer working hours; which omission on the part of the Press has been largely responsible for the imbroglio which still exists in the building trade.

Birmingham. GEO. ELVINS.

[Mr. Elvins's opinions were not distorted. We quoted his relevant points word for word, and where it was necessary to summarize, his meaning was exactly retained. The terms of settlement we reproduced from the daily Press. If there is any inaccuracy the fault is not ours. We have yet to learn from the master builders that the dispute is at an end.—Ed. A.J.]

"Road Up"

To the Editor of THE ARCHITECTS' JOURNAL.

SIR,—Can you tell me why our road repairers—our modern "highwaymen"—insist upon holding us up in so inconsiderate a manner? They never seem to be content to repair a narrow width of roadway at a time. Usually it is half, and often it is the entire width of roadway that is taken up. This was so recently at the Charing Cross end of Whitehall, and all traffic had to be diverted to Northumberland Avenue and the Embankment, with great inconvenience to the travelling public.

Such methods are so manifestly absurd that it is difficult to believe they are deliberate, yet one can come to no other conclusion. When will our road repairers learn wisdom?

Ealing. JOHN HOTCHKISS.

A Road Bridge up the Thames

The suggestion of a road bridge up the centre of the Thames, referred to in a letter to "The Times" on Wednesday last by Mr. A. T. Taylor, and commented upon in a note this week, has already received certain preliminary attention at the Guildhall.

Shortly before the recess a member of the Corporation of London brought forward a suggestion for the construction of a bridge from the centre of London Bridge right up the middle of the river to end at Westminster Bridge. He urged that such a bridge would do much to relieve the congestion in the City streets and provide for slow, or preferably for fast, motor traffic. The suggestion, however, was considered impracticable by certain responsible officials and by the members of the committee before which it was brought. It was pointed out that there are three railway bridges to be negotiated, that the Port Authority would object because such a structure would interfere with the navigation of the river, and that the cost would be enormous.

The proposer, however, was not able to explain his scheme fully, because it was held that the committee before which it was brought had no power to deal with such a matter. He accordingly drafted a notice of motion calling on the Court of Common Council to refer the scheme to the Bridge House Estates Committee for investigation and report.

This proposal is for a bridge on the same level as the existing bridges, with gradients rising or falling according to the decision whether the viaduct should pass over or under the railway bridges. As the City has no jurisdiction beyond its own boundaries the scheme would have to be confined to the interval between London Bridge and Blackfriars Bridge. Mr. Taylor, however, could secure consideration by the London County Council, of which he is a member, of his plan for a high level road for the whole distance between London Bridge and Westminster or beyond.

Bridgeton Public Halls Competition, Glasgow

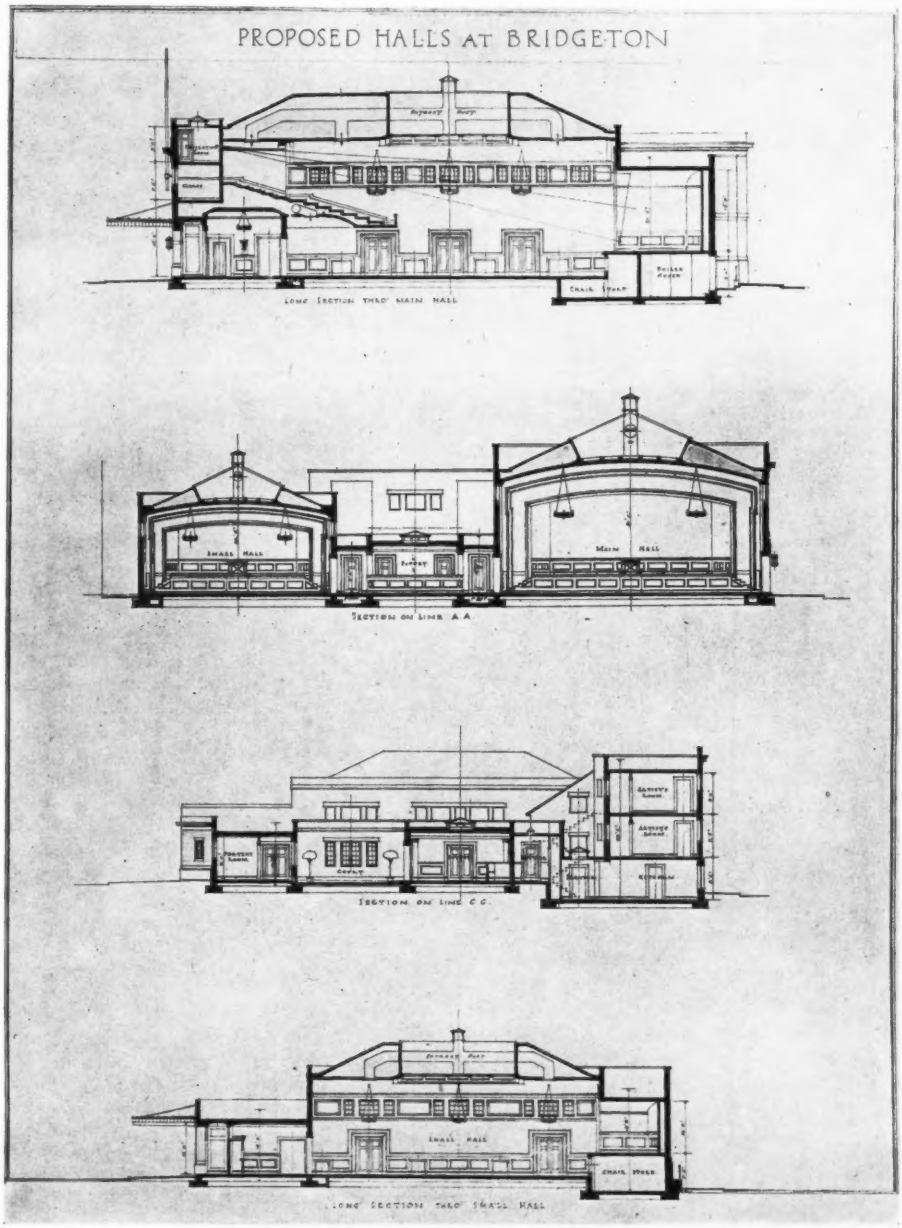
ON this and the following pages we illustrate the design of Mr. C. Cowles-Voysey, A.R.I.B.A., which has been placed first in the Bridgeton Public Hall Competition, Glasgow. Between ninety and one hundred schemes were submitted. Four premiums were offered by the Glasgow Corporation, and the authors of the other designs which were awarded premiums by the assessor, Mr. James Lochhead, F.R.I.B.A., were as follows :—

Second—D. MacNaughton and Son, and John Arthur, Glasgow.

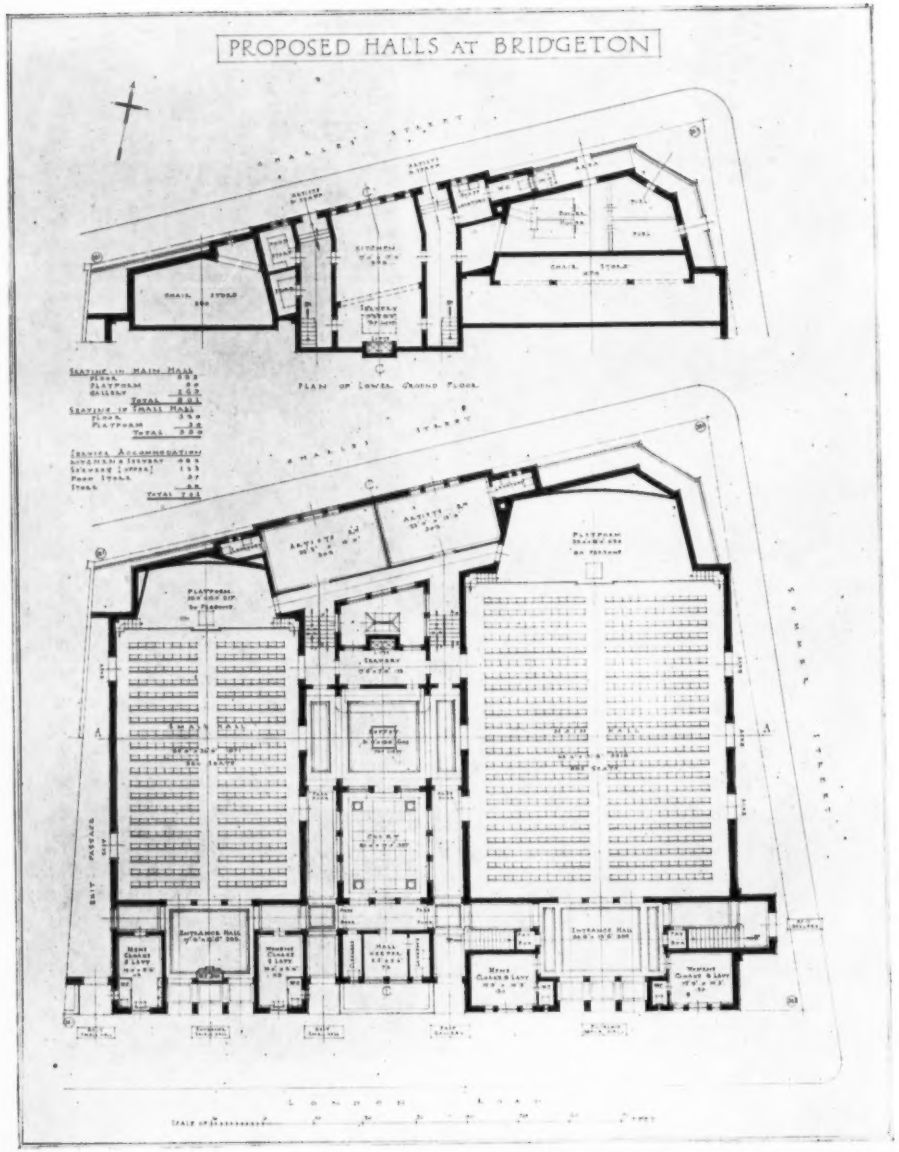
Third—Walter Alison, Kirkcaldy.

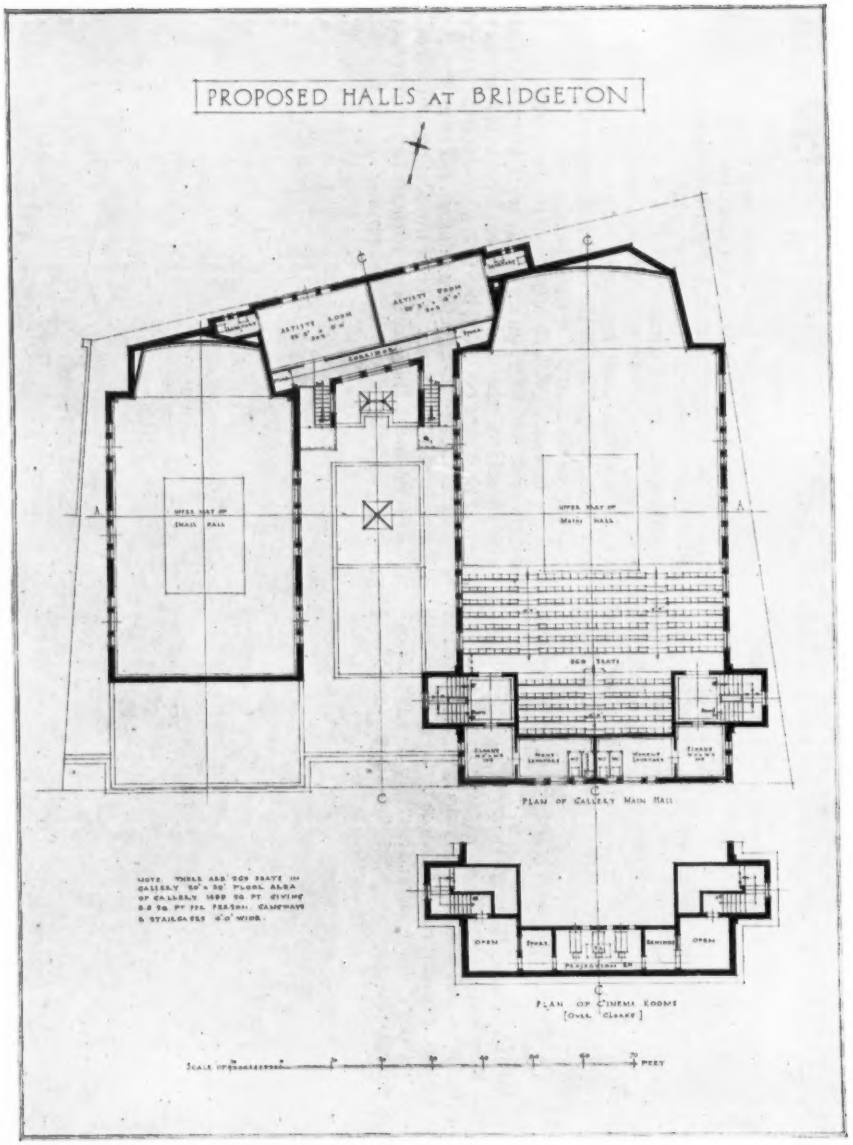
Fourth—Harrison and Ash, Newcastle-upon-Tyne.

In criticizing in our last issue the designs submitted in the competition a special contributor says he thinks it will be agreed that the design placed first fully merits its position, and provides in its general lines the right solution of the problem. The two halls, with their long axis at right angles to the main front, and the buffet accommodation between, is the general arrangement adopted in a number of the schemes, but the manner in which this arrangement is worked out by the winner, Mr. C. Cowles-Voysey, is the most satisfactory. It is not without defects, however. The cloak-room and lavatory accommodation is very inadequate, the gallery of the large hall projects very deeply over the area, and the ceiling heights are cut down too greatly; but these defects can be remedied. The internal court is an interesting feature of the plan, but the practical requirements of the buildings would probably be served better if the space occupied by it were used for the improvement of the cloak-room accommodation. The architectural treatment of the exterior is both interesting and effective. It has refinement and character without any extravagance of detail, and expresses plan and purpose.

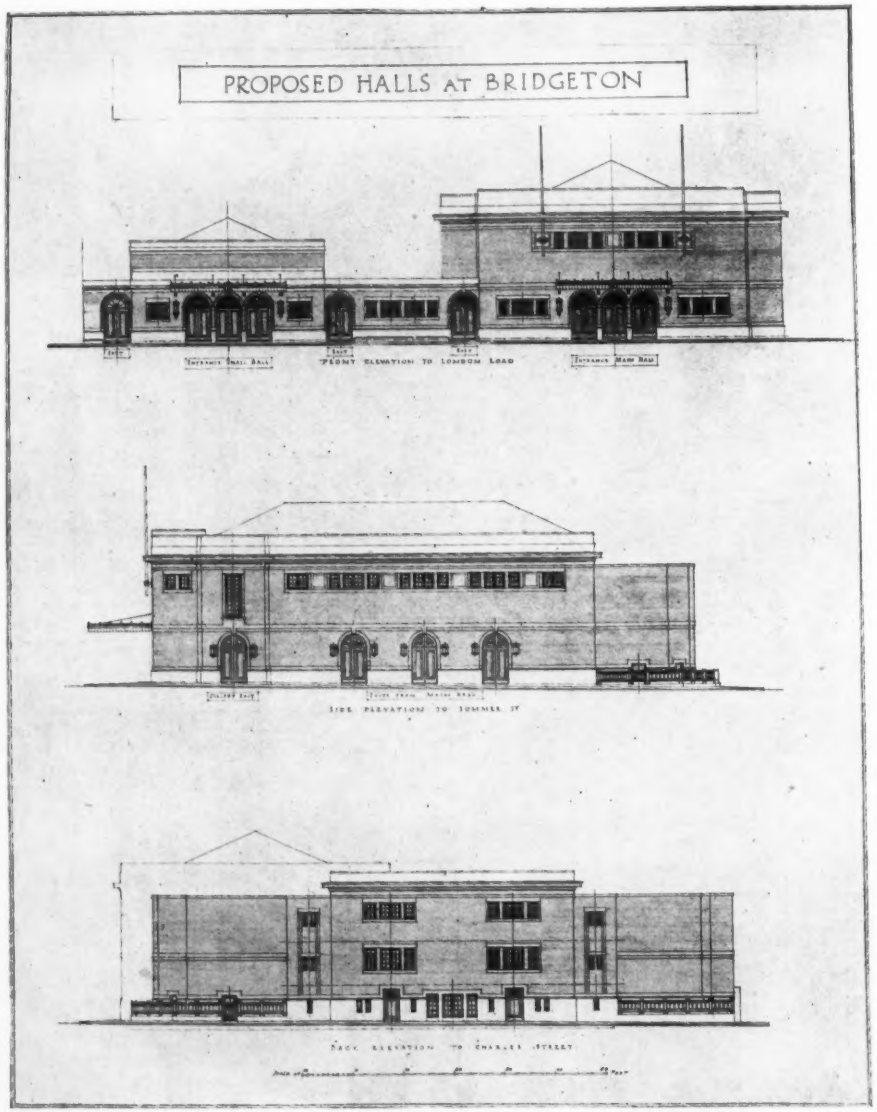


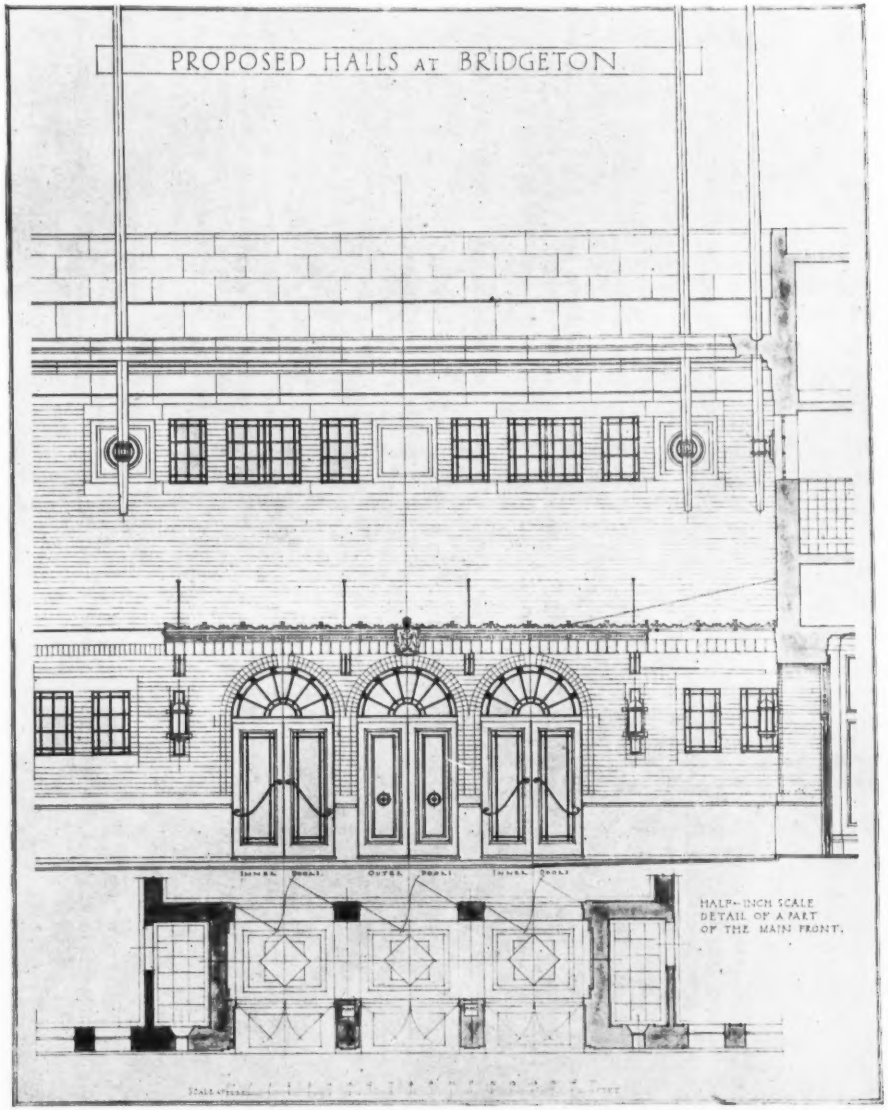
SECTIONS OF THE WINNING DESIGN





THE BRIDGETON PUBLIC HALLS COMPETITION, GLASGOW: PLANS OF THE WINNING DESIGN.
C. COWLES-VOYSEY, A.R.I.B.A., ARCHITECT.





THE BRIDGETON PUBLIC HALLS COMPETITION, GLASGOW: ELEVATIONS OF THE WINNING DESIGN.
C. COWLES-VOYSEY, A.R.I.B.A., ARCHITECT.

The Drainage of Roofs—3

By ERNEST G. BECK, Wh.Ex., Assoc.M.Inst.C.E.

REGARDING the manner in which an ordinary downpipe acts in conducting rainwater from a gutter, a little consideration will suffice to show that such pipes could not possibly run full-bore, even at the head, where the velocity of particles is small, much less at the foot, where the velocity of particles may be much greater. Even with a large tank having an open pipe connected to an aperture in its floor, as indicated in Fig. 12, the pipe cannot be persuaded to run full-bore; and it is unthinkable that any gutter on the roof of a building could bring water to the head of a downpipe in sufficient volume to cover the outlet as in the case of the tank illustrated.

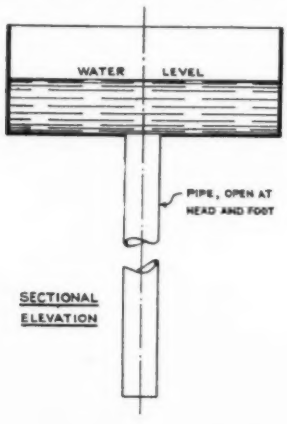
Observation of downpipes conducting the drainage from roofs during heavy rain will show beyond the possibility of question that the water flows down the inner surface of the pipe in a film, and no matter how severe the loading, water never falls—even in separate drops—down the bore of the pipe clear of the sides; hence it follows that the dimension of a downpipe which determines its conduction capacity is the length of its inner circumference or perimeter in cross section, and not the cross-sectional area of its bore.

There are, however, other factors which influence the conduction capacity of downpipes.

As the water slides vertically down the sides of the pipe its velocity increases, and the thickness of the film is reduced correspondingly.

The velocity of the particles in the film of water sliding down the pipe does not increase at the same rate as would that of a solid body falling freely in vacuo; and calculations based upon the ideal relation $v = \sqrt{2gh}$ cannot yield indications even roughly consistent with the facts as observed in different cases, no matter what coefficients be introduced. Air rising in the pipe, the roughness of surfaces, breaks due to joints being not in perfect alignment, surface tension in the liquid film—and, doubtless, other influences less apparent—must all tend to reduce the velocity. Moreover, this tendency must increase as the thickness of the film decreases, and as the velocity of particles increases.

From a consideration of these facts it follows that the quantity of water which a downpipe can discharge from its shoe in a specified interval of time is neither more nor less than that which can enter at the head of the pipe during the equal and corresponding interval allowing for the movement of the water from the head of the pipe to the shoe; and although this may at first sight appear so obvious as to render even mention of it superfluous, it will be found, on closer examination, that both the fact and its inevitable consequences seem to have escaped notice hitherto. Had it been otherwise, no rule for the provision of downpipes based upon the cross-sectional area of bore could have been either proposed seriously or permitted to stand for so long unchallenged.



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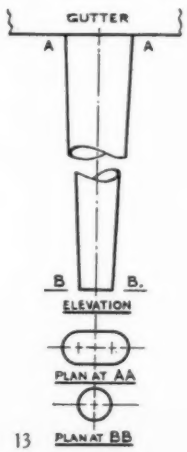

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From observation of numerous cases under different conditions, the inference drawn is that, for practical purposes, the velocity of the particles entering the downpipe may be taken as 1 ft. per second when the depth of water in the gutter near the outlet is about 1 in.; and this, bearing in mind the disturbing influences, is reasonably consistent with the velocity of 2 ft. per second indicated by the ideal relation for a depth of $\frac{3}{4}$ in.

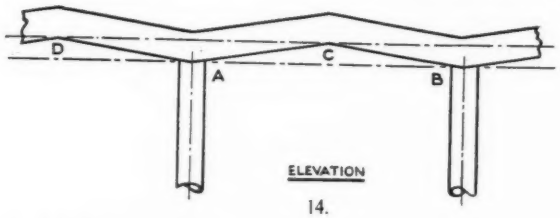
As will be seen presently, there is no need to do so—and the suggestion is open to objection on practical, economic, and other grounds; but were it desired to increase the conduction capacity of downpipes, one of the most effective methods would be to make the pipes tapered, with a wide mouth at the top fitting a similarly shaped outlet in the gutter, as indicated in Fig. 13, thus providing large surface for the descending water film where its velocity is small, and reducing the surface as the velocity increases.

Further proof that downpipes do not run full-bore at any part of their height (although the actual provision in practice is nearly always far short of that recommended by the rules) is furnished by the fact that, almost invariably, a downpipe discharges into a pot or sink, the floor of which is formed by the gulley grid—containing, generally, five holes, each about $\frac{3}{4}$ in. diameter; while the gulley is cleared by a 4 in. drainpipe laid with a gradient of, perhaps, 1 in 50. As with the downpipe, so with the drain, the quantity of water which can be conducted along it is no more than that which can enter at the head of the pipe; and it is clear that the initial velocity of flow in a drain sloping at only 1 in 50 must be appreciably less than that in a downpipe standing vertically. Hence it follows that a 4 in. downpipe running full-bore at its head would immediately choke a 4 in. drain laid with the common gradient—to say nothing of the gulley, with its five small holes. Yet 4 in. rainwater gulleys are never choked unless either the holes in the grid become stopped by solid matter or the drain from it becomes surcharged through lack of clearing capacity in the superior drains into which it delivers—neither of which causes can be regarded properly as evidence of inadequacy in the gulley or its drain.

Further, only so much water can enter the drain as can pass through the holes in the grid; and it will be seen that the combined area of these holes, in the common case quoted, is but a small fraction of the bore of a 4 in. pipe. Since the water from the downpipe falls on to the surface of the grid, the velocity which it has acquired in falling from the gutter is destroyed; and it passes through the holes in the grid with only the small velocity due to the depth of water over the grid. Supposing the equivalent of one hole in the grid to act as air vent for the space below, there will remain the equivalent of only four $\frac{3}{4}$ in. dia. holes, having a combined area about 1·8 sq. in., through which water may enter the drain; and this (though probably a generous estimate) is but one-seventh of the 4 in. downpipe bore.

Were the downpipe discharge sufficient to maintain 4 in. depth of water on the grid, the velocity through the holes would be about 4 ft. per second, and the volume rate of water passing through the four holes would be about $\frac{1{\cdot}8 \times 4}{144} = 0{\cdot}05$ cub. ft. per second, or 180 cub. ft. (about 1,040 gallons) per hour.

With rainfall at the extraordinarily severe rate of 1 in. per hour, the volume rate of water falling upon a roof area of A sq. ft. would be $\frac{A}{12}$ cub. ft. per hour; and equating this with the 180 cub. ft. per hour estimated above as passing



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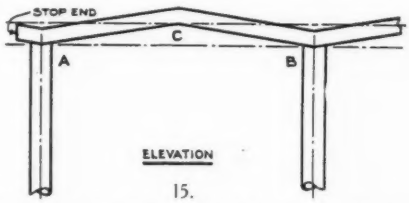


15.

the grid, $\frac{A}{12}=180$, whence $A=12\times180=2{,}160$ sq. ft. For a 4 in. downpipe to conduct water at the rate of 180 cub. ft. per hour, with the initial velocity 1 ft. per second, the thickness of the water film at the head of the pipe may be readily estimated as follows :—

Taking the inner circumference of the pipe as 1 ft., and the film thickness as t in., the volume rate of conduction would be $1\times\frac{t}{12}\times1\times60\times60=300\,t$ cub. ft. per hour; and equating this with 180 cub. ft. per hour, $300\,t=180$, whence $t=\frac{180}{300}=0{\cdot}6$ in.—and this would leave, even at the head of the pipe, the equivalent of a 2·8 in. dia. circle entirely free of water, the area of the void increasing as the film thickness decreases by reason of the acceleration during its descent.

Yet the rule of 1 sq. in. of downpipe bore for each 60 sq.ft. of sloping roof surface (inclined at, say, 30 deg. with the horizontal) would require, for 2,160 sq. ft. of horizontal area covered, a total downpipe bore about $\frac{2160\times1{\cdot}155}{60}=41{\cdot}6$ sq. in.—i.e., *four 4 in. downpipes* instead of one.

It is, of course, seldom that an area so large as 2,160 sq. ft. can be drained by a single downpipe; but from the foregoing considerations it is evident that the provision of downpipes and drains in accordance with the old rules is grossly extravagant. And this may be utilized in practice in many ways to secure appreciable advantages as regards convenience and economy. For example, it is clear beyond the possibility of question that the use of 5 in. and 6 in. downpipes, round or square, cannot be justified for any conceivable requirements of roof drainage in this country, since the ordinary 4 in. diameter downpipe is obviously capable of clearing water at a rate far higher than that at which the gutters in any practicable arrangement could supply it.

An argument sometimes advanced favouring the provision of numerous downpipes is that, in the event of some being choked by obstructions, the remainder may be sufficient to prevent dangerous flooding of the gutters; but this argument, although it may seem plausible at first sight, will be found insupportable and valueless if examined more closely.

In the first place, observation will show that the stoppage of a downpipe is an extremely rare occurrence, and even were it more common, the duplication of pipes could not be relied upon as a safeguard, for if the accumulation of solid matter in gutters be tolerated to an extent sufficient for the stoppage of one downpipe, there is no ground for supposing that it will be insufficient to stop two or more, since gutters are seldom (practically never) graded continuously so that water may flow on past a choked outlet in search of one that is not choked. For all ordinary circumstances, the provision of a suitable wire domical guard at the head will prevent stoppage of the downpipe, though even such precautions should not be necessary (and from several points of view the system is certainly better without them) if reasonable care be exercised in keeping the gutters clear.

Where a stretch of gutter is provided with two or more outlets, the gutter is almost invariably arranged with a summit (or watershed) between adjacent pairs of outlets, as indicated in Figs. 14 and 15; and it will be plain that if the sole reason for the use of two downpipes instead of one in such a stretch be to provide for the possible stoppage of one, the purpose is not served. For if the pipe A in Fig. 14 be stopped (supposing the pipe B to remain clear), the water will accumulate in the gutter DAC until its level reaches the summit C, after which any further water delivered may trickle into the stretch CB for clearance by the pipe B; but the stretch DAC will remain charged to the level of C until either the pipe A be cleared or the water in the gutter evaporated. If both pipes A and B become stopped, the gutter must overflow about both outlets when the depth of water exceeds that of the gutter section. With a stop end just beyond A, and the difference between the gutter levels at A and C more than the depth of the gutter section, as indicated in Fig. 15, overflowing at A will be inevitable if that pipe be stopped, even with comparatively light rainfall, and this cannot be prevented by the provision of any number of downpipes beyond C in the direction of B.

Obstructions are much more common in gutters than in downpipes; and, as might be expected, it is in those parts of gutters where water cannot attain any considerable depth, or flow with considerable velocity, that obstructions most frequently remain. Leaves, twigs, dust, paper, and such refuse are likely to collect at angles in gutters—particularly if there be several angles close together in one stretch, so that the velocity of flow is kept small by reason of the resistances set up through the frequent changes of direction; but with gutters containing not too many angles, leaves and other solid matter will be carried along with the stream to the outlets, and pass down the downpipes, probably causing (as is common experience) at least partial stoppage of the drain gulley. This latter fact, by the way, constitutes an objection to the use of grids or guards at the heads of downpipes, for such fittings trap the solid matter in the gutter, where it cannot be seen without some trouble, while its removal from the gutter is much more difficult than from the gulley.

Birds are often blamed for gutter stoppages when the fault might be much more fairly attributed to the designer. Birds do not build nests in open gutters or over downpipes—which are very often wet, and always draughty. They are, however, skilful in finding sheltered nooks in which their nests will remain warm and dry. Some designers seem to possess remarkable aptitude in the provision of "cosy corners" about gutters; and these are exploited intensively—doubtless by enterprising (bird) estate agents—as eligible building sites. The risk of gutters becoming stopped by birds' nests may be practically eliminated through the exercise of proper care in designing—and failing such care, the deficiency cannot be made good by any multiplicity of downpipes, gulleys, and drains, no matter how extensive and costly. The more simple the gutter arrangement, and the greater the facility for access in all parts, the less likelihood will there be of trouble arising through stoppages in any part of the system.

Snow is one of the few things which can stop a downpipe—or, rather, an outlet—the flakes bonding as they settle, and forming cantilevered support for subsequent flakes until the aperture is bridged over. It will be observed that such action is favoured, and the difficulty of clearance is increased, by the provision of guards or grids at the outlets. Methods for dealing with snow and the drainage from it will be discussed later, but in the meantime it will be seen that mere extravagance in downpipes cannot possibly serve the purpose, since a snowfall capable of covering one outlet will be capable of covering any number in the same system.

From all points of view the most satisfactory basis for design is an adequate provision for the most exacting duty likely to be demanded, but without waste or extravagance.

(To be continued.)

[The previous articles in this series appeared in our issues for July 23 and August 13.]

The Mead Cottage, West Drayton, Middlesex

HUBERT F. BATEMAN, Architect

THIS cottage is of the bungalow type, and has been erected for Mr. C. Aubrey Smith on land to the rear of the owner's existing house, but with a frontage to Wise Lane. It has a south aspect, and commands a fine view across the fields to Harmondsworth, with its church and famous Tithe barn.

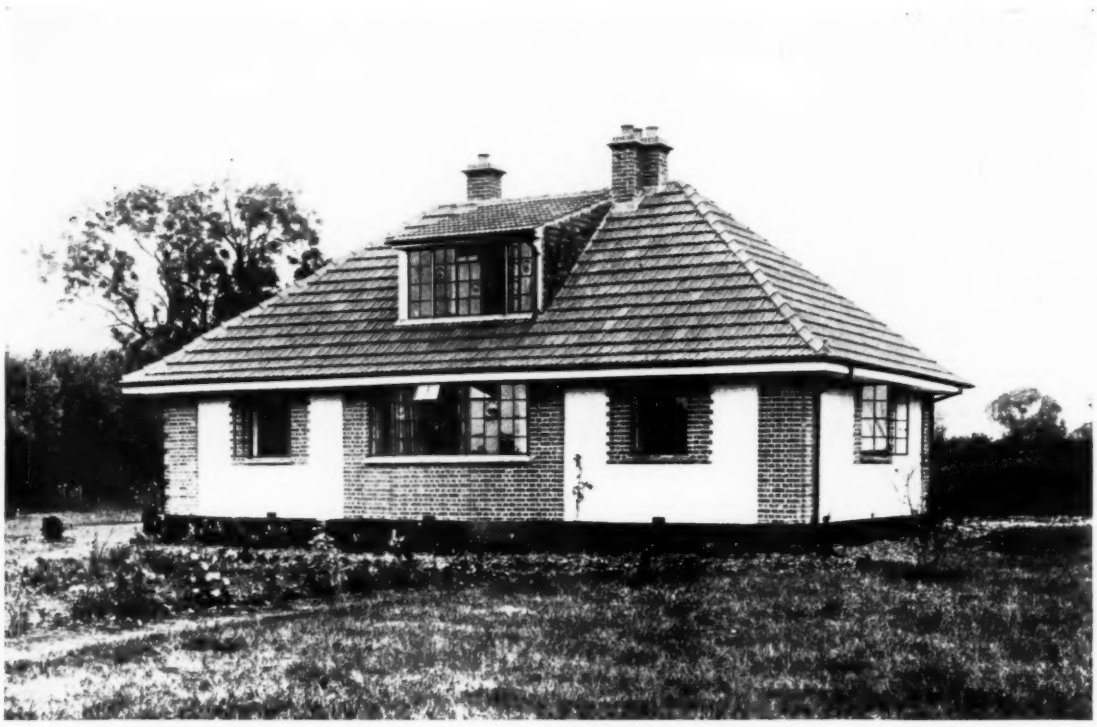
The plan, with its long living room serving as dining and living room combined, and its spacious cupboards and storage, meets the special requirements of the owner. Special attention has also been paid to labour saving, and the cottage can be worked by one maid, who has a bed sitting-room on the ground floor.

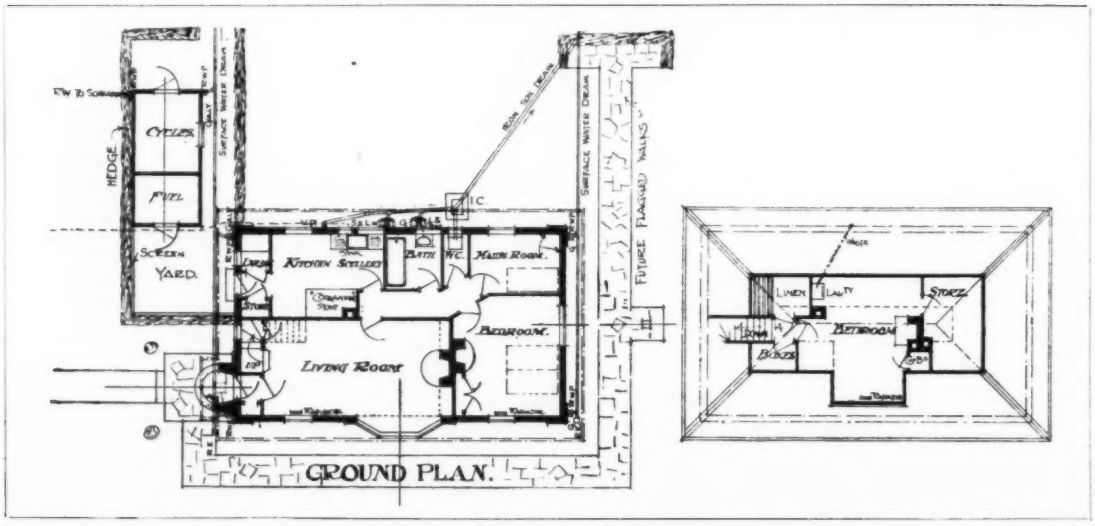
The walls are of local bricks, finished in cream rough-cast with a tarred cement base. A feature has been made of the groins to windows, angle piers, and entrance doorway, which are in purple and red varied coloured facings bricks from Langley, London.

The hipped roof has very wide overhanging eaves, and it is covered with "Marseilles" tiles on battens and boarding. Old multi-coloured tiles are fixed to the dormer cheeks.

Internally the house is heated by large open fireplaces built in red brick, and the domestic hot water and heating is provided by The National Radiator Co.'s Cook-an-Heat system and Ideal Classic Radiators. The steel casements are of standard cottage type, supplied by The Crittall Manufacturing Co. All internal sills are formed with red quarries.

The general contractors were Messrs. S. Bateman & Son, of Harmondsworth, Middlesex.





Enquiries Answered

Enquiries from readers on points of architectural, constructional, and legal interest, etc., are cordially invited. They will be dealt with by a staff of experts, whose services are specially retained for this purpose. If desired, answers will be sent direct through the post. In no case is any charge made for this service. Whenever diagrams accompany an enquiry, they should be clearly drawn and lettered and inked in.

STAINS IN POLISHED WOODWORK.

"R. E." writes: "I have just remodelled an old house, in the course of which I polished some old oak woodwork. Although the woodwork is in an upper room and is free from dampness, a milky appearance has become noticeable under several parts of the polish. Can you tell me how this can be removed?"

—There is only one remedy—to remove all the polish down to the woodwork. This should be done with a paint remover, free from alkali and made principally from acetone. This may be used without its being necessary to apply any acid after the polish is removed, the surface being simply wiped down with a piece of waste dipped in turpentine or white spirit. Before repolishing great care should be taken to see that the surface is quite dry.

HEATING A VILLAGE HALL.

"M" writes: "I should be much obliged if you could show a reliable method of calculating the amount of heating surface required for heating a village hall as described below:—

"The hall is an oblong, 63 ft. by 25 ft. 3 in. by 16 ft. high. One of the shorter walls is a party wall adjoining the hall offices. All the walls are of granite rubble 1 ft. 9 in. thick, with strapping, lath, and plaster. Windows are on both long sides and have a total glass area of 197 sq. ft. The hall, ceiled at wall-head level, has a pitched roof over, and the joisted wood floor has a ventilated air space under, but no basement. The exposed gable faces north, and the two long sides face east and west respectively. Opening hopper windows and ventilators are provided causing both cross and the usual natural ventilation. I have calculated by various formulæ the amount of radiating surface required to maintain a heat of 60°F. in the hall when the outside temperature is 30°F., using a low-pressure hot water circulation, but in certain cases the results vary considerably as shown:—

	sq. ft.
By formula given in the I.C.S. pocket-book ..	280·7
Using co-efficient multipliers for various materials enclosing hall, as given in Kempe's Engineers' Year Book (1913)	277·0
Approximate rule 10 sq. ft. rad. surface per 1,000 cub. ft. content of hall, plus 1 sq. ft. rad. surface per 6 sq. ft. of glass	287·4

"To these would be added, say, 15 per cent. as allowance for north and east exposure, making an average of 281·7 plus 15 per cent.=323·9 sq. ft. By calculating in detail the heat lost by various containing materials according to co-efficients given in the 'Ideal' radiator catalogue (National Radiator Coy.), making allowance for three air changes per hour, and for the east and north wall exposures, the resultant necessary heating surface works out as 571·6 sq. ft. The difference between 323·9 and 571·6 is rather disconcerting, and I would appreciate your advice on this problem."

—The difference in the results obtained by "M" is probably accounted for by the fact that the rules given in "The Engineers' Year Book" are only approximate ones, and no allowance is made for contingencies.

In a system of this sort a great deal depends upon the efficiency of the radiators, the manner in which they are placed, and the arrangement of the piping.

In practice it is desirable to allow for a certain amount of inefficiency in these respects, and no doubt the National Radiator Co.'s catalogue takes this into consideration. For example, radiators are very commonly mounted close to a wall or window, with the result that a considerable percentage of the radiant heat is wasted. Investigations by the German Government have produced a set of co-efficients which have been translated by Wolff in his book, "The Heating of Large Buildings." The table of co-efficients is here reproduced:—

Thickness of Brick Wall, in inches.	4	8	12	16	20	24	28	32	36	40
Co-efficient	·658	·458	·315	·258	·228	·194	·165	·143	·129	·114

1 square foot, wooden beam construction, planked over, or ceiled..	as flooring	·083
	as ceiling	·104
1 square foot, fireproof construction, floored over..	as flooring	·122
	as ceiling	·145
1 square foot, single window		1·215
,, ,, single skylight		1·03
,, ,, double window		·572
,, ,, double skylight		·621
,, ,, vault light		1·43
,, ,, door (65 per cent. wood, 35 per cent. glass)		·572
1 square foot, door (plain)		·414

To these must be added: 10 per cent. where the exposure is a northerly one, and winds are to be counted on as important factors; 10 per cent. when the building is heated during the daytime only, and the location of the building is not an exposed one; 30 per cent. when the building is heated during the daytime only, and the location of the building is exposed; 50 per cent. when the building is heated during the winter months intermittently, with long intervals (say, days or weeks) of non-heating.

The above co-efficients represent the heat transmitted in units per hour per square foot of surface per degree of difference in temperature between the air in the building and the external air.

From "M's" figures we have a total wall area of 2,824 sq. ft., and from this we have to subtract the window area of 197 sq. ft. and also the area of the doors. As "M" does not mention the latter, we will assume 50 sq. ft. for these, leaving a net wall area of 2,577 sq. ft.

The loss per hour may then be tabulated as follows, allowing 10 per cent. for the north-east aspect and 30 per cent., assuming that the building is heated only in the daytime. The table does not give a co-efficient for a 21-in. wall, but by interpolation we can ascertain this to be ·2195.

	Area = A.	Co-efficient from Table.	Co-efficient plus 40% = C.	Heat Loss in B.T.U.'s per Hour = A×C×30°F.
Walls	2,577	·2195	·3073	23,760
Ceiling	1,590	·104	·1456	6,945
Floor	1,590	·083	·1162	5,550
Windows	197	1·215	1·701	10,050
Doors	50	·414	·5796	870
Total				47,175

or, say, in round figures, 47,200.

The air content of the building amounts to 25,452 cub. ft., which, renewed three times per hour, amounts to an hourly total of 76,356 cub. ft.

One cubic foot of saturated air at 30°F. weighs ·080 lb. The total weight of air to be dealt with per hour is, therefore, 76,356×·080=6108·5 lb.

Now, the specific heat of air at constant pressure is ·2379, and one B.T.U. will raise 4·2034 lb. of air through 1°F., therefore: $\frac{6108{\cdot}5}{4{\cdot}2034} \times 30 = 43{,}596{\cdot}8$ B.T.U.'s per hour,

say, 43,600 in round figures, where 30 deg. is the temperature increment required.

Add to this the loss as ascertained above, and the total heat required becomes: 43,600+47,200=90,800 B.T.U.'s.

Assuming the temperature of the circulating water to be 150°F. the difference is 150—60=90°.

The actual efficiency of the radiating surface depends upon a number of variable factors, but we may take the figure adopted by the Sturtevant Coy. of 1·8 units of heat dissipated by each square foot of radiating surface per hour for each degree F. difference in temperature, then the amount of heat transmitted per foot of surface will be: 90×1·8=162 units per hour. Dividing the total heat by this figure we have: $\frac{90,800}{162}$ =560·49 sq. ft., which approximates closely to the figure "M" has obtained from the National Radiator Coy.'s catalogue.

He will, therefore, be well advised to follow their formulæ if adequate results are to be achieved. H. C. C.

COLD WOODEN HOUSES.

'Querist" writes: "My experience of wooden houses is that they are hot in summer and cold in winter. Can you suggest any means of improvement? The houses are of Army-hut type, covered with Ruberoid or corrugated iron.

—A wooden house of Army-hut type is not likely to bring out the best qualities of wooden construction, as the doors and windows are generally placed where they will fall conveniently, one in each portable section of the hut, and are not arranged with a view to the greatest comfort of the inhabitants. The joinery also usually allows draughts to enter which chill the dwelling in winter. Careful attention to all cracks and the use of cover fillets often effect an improvement.

One method of preventing extremes of temperature affecting the interior of the building is to pack all spaces between the outside lining (of weather-boarding), and the inside lining (of matchboard or Fibrocement slabs) with slag wool—packed tightly between stud and stud. In a house already erected the packing of the slag wool is performed by removing a weather-board in each section and pushing the material through the gap. A height of not more than 3 ft. is attempted in the first place, and when this has been well rammed full, the weather-board is replaced, and another one removed at a point 3 ft. higher up the wall.

The roof is sometimes more readily treated from the interior by removing the inner lining.

Floors of Army huts are often full of cracks and open joints, which also need treatment. Before erection the slag wool can be applied to the underside of the floor, and retained in position by a layer of matchboarding upon what will ultimately be the underside of the joists.

After erection, this method is not practicable, and the draught and cold must be prevented from entering by means of added coverings on top of the floor surface.

A layer of good quality felt paper and a stout lino spread over the whole floor has a marked effect upon the interior temperature.

Where the wooden house is of a permanent character it is worth while to enclose the space around the lower part of the walls below floor level, either by carrying down the weather-boarding or by building a plinth of bricks or concrete. This plinth is sometimes arranged to stand clear of the wall, and to form the basis for a future casing, generally only 4½ in. thick, of brickwork up to eaves level.

The brick veneer is strengthened with hoop-iron or special mesh reinforcement in the bed joints, and is joined to the wooden studding by long nails driven in at the top of every third or fourth course, the nail heads being covered by the mortar of the joint.

The comparative warmth and comfort of old wooden houses often puzzles the shivering inhabitant of an Army hut, but the probability is that they, too, were draughty when new, and that a great deal of crack filling, caulking, and many coats of paint effected improvements on the crude condition of the building soon after erection.

The use of thin stain instead of paint on the exterior of modern wooden houses probably has a very marked effect upon their resistance to draughts and changes of temperature, and the careful stopping of cracks and covering with a full-bodied pigment would be beneficial. W. H.

BUILDING BY-LAWS.

"J. H." writes: "1. How far, or to what extent, are the by-laws of a local authority legally binding upon it? 2. Where it does not state in the by-laws of a local authority that the Public Health Acts are adopted, can the local authority object to any construction or sanitary provision, or the lack of these on the strength of the Public Health Acts? 3. Supposing one requests a copy of the by-laws of any local authority, and proffers payment for same, is it incumbent upon the local authority to provide one?"

—1. Where by-laws have been formally adopted and have been approved by the Local Government Board (now merged in the Ministry of Health) they are binding on all parties—including the public authority itself—save in the rare instances where discretion is placed in the hands of that authority by the Public Health Acts. 2. The Public Health Acts always apply in some measure—even where there are no by-laws—but certain parts of those Acts must be formally adopted by the Local Sanitary Authority and be approved by the Ministry of Health, before those portions apply. 3. I have never known a refusal to supply a copy of the local by-laws (except when temporarily out of print), but as they always follow the same stereotyped model there is no difficulty about ascertaining what they are. A complaint to the Ministry of Health would soon right the matter in any event. F. S. I.

DESIGNS FOR A BUNGALOW.

"Architect" writes: "Some months ago I designed a small bungalow eligible for the Government subsidy, plans for which were duly approved by the local authority. An estimate for erection was accepted, and the builder supplied with blue print copies of plans (⅛ in. and ½ in.). He afterwards requested an additional ⅛ in. copy as he said the previous one was mutilated. I have now ascertained that he is erecting another bungalow upon the plot next but one, precisely similar in elevation and almost identical in plan, the only alteration being the addition of two fireplaces and a larder. I have noted the result of a lawsuit devolving upon copyright reported in your issue dated November 7, 1923, but this appears to apply to copies of drawings only. Have I any legal redress, or alternatively upon what basis am I entitled to charge him for the use of the additional drawing which has obviously been used as a basis for the other bungalow?"

—Under the circumstances the builder is liable for your just fees for the second set of plans. All the correspondence should be submitted to a solicitor, and steps taken against the builder in accordance with his advice. Subject to a perusal of the correspondence and closer examination of the facts it would appear to us that the builder is liable for full fees to the architect; but in any case he is liable to pay a *quantum meruit* for the second set of plans which, according to the statement before us, he obtained by a subterfuge. S. J. S.

APPROVING PLANS.

"A" writes: (1) "Please advise me if an urban district council have the jurisdiction to disapprove of the accompanying plan (not reproduced). There is no objection to erecting the lower floor projection, but the upper floor has been rejected. No reason is given nor can I imagine any, especially as no right of light is involved. (2) Can one object to any person taking the chair of a plans committee if he also submits plans for approval and is not an architect?"

—(1) This is evidently not a question of a right of light, but of bringing forward a building in front of the existing building line. Section 155 of the Public Health Act, 1875, gives an urban district council power to prescribe a building line, and section 3 of the Public Health Act, 1888, prohibits the bringing forward of any building beyond the "front main walls of the house or building on either side of it" without the written consent of the urban authority. (2) There is no law to prevent a chairman of a building committee presenting plans for his own works—it is, of course, desirable that he should leave the chair that day, but there is no law to enforce that custom—it can very well be left to his good taste. F. S. I.

A CORRECTION.

In the reply to the enquiry concerning the "Strength of Floor and Walls," published last week, the word *ton* in italics is a misprint for *tan*, abbreviation for tangent.

Architectural Education

Some London Opportunities

A NEW strikingly-coloured poster has appeared in the streets of London in connection with the re-opening of the L.C.C. evening classes. It is entitled "Achievement," and the moral of the action depicted on the poster—a youth moving a heavy load by the use of a fulcrum—needs no explanation. As usual, revised prospectuses and time-tables are being issued by the various schools, and we have already received copies of those of the Architectural Association School of Architecture, the Polytechnic School of Architecture, the Camberwell School of Arts and Crafts, and the School of Building, Ferndale Road, Brixton. We have also received particulars of the atelier of the University College School of Architecture.

The director of education at the A.A. School of Architecture is Mr. Robert Atkinson, F.R.I.B.A., and the principal, Mr. Howard Robertson, S.A.D.G., F.S.Arc. The work carried out in the five years forming the complete course has been systematized and carefully graduated with a view to obtaining the best results from the average student, and not with the idea of "forcing" and obtaining startling results from a favoured few. A brief capitulation of the various years and the work done in each is as follows :—

The first-year students study the elements of building both in their architecture and construction. They receive explanations of the *raison d'être* of each element, these being synchronized with historical lectures showing the application of first principles. Geometry, perspective, freehand, sciography, and colour values, etc., are taught progressively, but pure design is only studied sufficiently to form a basis for construction. The lessons learnt in technique and theory are finally applied during each of the three terms in the execution of classic detail, such as the "orders."

In the second year the students specialize in portions of the practical and theoretical instruction given. More complex details of construction are studied and architectural design progresses based on historical periods—at first, compositions based on elements of the best examples of the principal periods, and, finally, original designs inspired by historical styles. Courses of lectures on history, decoration, construction, and the theory of design continue throughout all the years in the graduate course, and are synchronized with the practical work in the studios, while freehand and drawing are, of course, also studied.

The third year allows increased scope for design, there being no restriction to periods or styles, and construction is more advanced, working drawings being prepared with the design subjects as a basis. Twelve-hour studies in design are frequent, and the teaching of composition in mass and detail occupy a proportionately larger time than in the second year. Design and construction are taken as one subject and not dissociated, and every effort is made to fit students for the commencement of outside work in architects' offices which will follow during the graduate course. A necessity for the architectural student is attention to measured work and outdoor sketching, and every encouragement is given for the prosecution of these during the holidays and during the summer term.

In the fourth and fifth years the curriculum is arranged to provide further training to an enhanced standard. The time spent is almost evenly divided between advanced design and construction, with the addition of special subjects, such as "decoration" and "town planning." It is also required that the students show proof of at least six months' experience in practical building work either during or after these years, before the final diploma is granted.

In order to provide training facilities for those students who have not had an opportunity of benefiting by a full course in the day schools, the Association provides an evening studio or design club, independent of the day schools, where instruction is given to students who have had previous training and experience, but who wish to perfect themselves in architectural design.

The instruction at the A.A. Schools aims at applying a combination of the most satisfactory features found in the best similar institutions in this and other countries. In the study and working out of design, the student is encouraged to absorb the lessons of all fine past traditions; with this as a basis, the school attempts to develop the capacity for logical thought and reasoning necessary for solving modern architectural problems, together with the technique necessary for expressing such solutions. The school does not desire to perpetuate any one style or "manner" in architecture, but encourages original thought, realizing that the individuality of the architect is as varied as the problems which he will later be called upon to solve. On the purely technical side the school aims at preparing students to meet the practical realities of the profession with trained knowledge.

An atelier in connection with the London University School of Architecture, for the study of advanced architectural design, has been instituted in Malet Street, within three minutes' walk of University College. It will be under the direction of Professor A. E. Richardson, F.R.I.B.A., who will be assisted by Mr. H. Corfiato, S.A.D.G. The atelier is open to those who have obtained the degree of Bachelor of Arts (Architecture) in the University of London, to those who have obtained the diploma or certificate of architecture of the school, and to others who have reached a standard of efficiency approved by the director.

Subjects will be set at frequent intervals, and the finished schemes are judged by a special jury of practising architects. There will also be twelve-hour subjects and other competitions. Applications for admission, accompanied by statements of qualifications should be sent as early as possible to Mr. Walter W. Seton, M.A., D.Lit., F.S.A., secretary, University College, London (Gower Street, W.C.1).

In the Evening Department of the Polytechnic School of Architecture, Regent Street, the classes and courses of instruction are suitable for the examinations of the R.I.B.A., the Institution of Structural Engineers, the Surveyors' Institution, Auctioneers' and E.A. Institute, and the Institute of Builders. The president of the school is Sir Banister Fletcher, F.R.I.B.A., F.S.I., F.R.G.S., F.R.S.I., and the head of the school, Mr. George A. Mitchell, F.R.I.B.A., M.I.Struct.E.

At the termination of the session and based upon the school examinations, the Board of Studies will award silver and bronze medals to successful students for class-work, homework, and studio testimonies. The Polytechnic diploma and the senior grouped course certificates, are also awarded to students reaching the necessary standard of proficiency.

The "Bossom" gold medal for design is offered annually for competition among the students of the school. The subject of competition and the conditions for the session 1924–1925 will be given to eligible students upon application. The school is recognized by the R.I.B.A. for the purpose of the "Bossom" medal and travelling studentship competition.

The evening classes in architecture at the Camberwell School of Arts and Crafts cover drawing, design, and history, and, together with building construction, are intended to supplement the daily work of those engaged in the design, construction, and decoration of buildings. Architectural design includes the design of modern buildings, simplicity of planning and decoration being aimed at; practical points such as cost-limitations, by-laws, ventilation, etc., are considered, and instruction is given in period decoration and the preparation of designs and perspectives for interiors. Assistance is afforded in the preparation of testimonies of study for professional examinations, and also in the preparatory work required for admission to the Royal Academy and other architecture schools. The teacher of architecture is Mr. L. Blanc.

The work of the architectural classes at the School of Building, Brixton, will be under the general superintendence of Professor Beresford Pite, assisted by Mr. H. F. Murrell, A.R.I.B.A., Mr. W. R. Jaggard, F.R.I.B.A., and Mr. A. R. H. Jackson, A.R.C.A. Lectures upon examples, and criticisms of the students' work, will be given during the session by Professor Beresford Pite. Students, who, having passed the preliminary examination are admitted probationers of the R.I.B.A., will have opportunities for preparing the subjects of the intermediate examination in history and design, and for the preparation of all the testimonies of study. Facilities are provided for instruction in the language subjects required for registration as a student of the R.I.B.A. Students of the R.I.B.A., having passed the intermediate examination, will undertake the problems in design required for the final examination under the tuition provided at the school.

List of Competitions Open

Date of Delivery.	COMPETITION.
Sept. 24	Row of shops with hotel over. Premium £150. Apply Mr. H. Walduck, Imperial Hotel, Russell Square, W.C.1.
Sept. 30	The Hamilton War Memorial Committee invite designs for the proposed war memorial to be erected in the Public Park. The estimated cost of the memorial will be £2,000. Premiums £60, £40, £20, and £10. Mr. G. A. Paterson, President of the Glasgow Institute of Architects, will act as Assessor. Apply, with deposit of £1 1s., to Mr. P. M. Kirkpatrick, Town Clerk, and Clerk to the Committee, Hamilton.
Sept. 30	Designs are invited for a statue in bronze and a pedestal (at a cost of about £5,000) in honour of the late Sir Ross Smith, K.B.E. Apply The Agent-General for South Australia, Australia House, London.
Sept. 30	Competitive designs are invited for a Memorial Club House and Pavilion to be erected on the ground of the Glasgow High School Club at Anniesland, Glasgow. The competition is confined to former pupils of the High School of Glasgow. Apply Mr. Hugh R. Buchanan, Hon. Secretary, Glasgow High School War Memorial Committee, 172 St. Vincent Street, Glasgow.
Sept. 30	The Committee of the Harrogate Infirmary invite designs for the extension of the infirmary by the addition of 67 beds. Application had to be made by May 31.
Sept. 30	The Newton-in-Makerfield Urban District Council invite designs for Public Baths. Premiums £150, £50 and £25. Assessor Mr. Arnold Thornley, F.R.I.B.A. Application had to be made to Mr. C. Cole, Clerk to the Council, Town Hall, Earlestown, Lancashire, not later than July 25.
Jan. 20, 1925	Art gallery and museum of art for the City of Manchester. Assessors, Mr. Paul Waterhouse, Professor C. H. Reilly, and Mr. Percy S. Worthington. Premiums £500, £300, £200, £100. Apply with payment of 5s., which is not returnable, to Mr. P. M. Heath, Town Clerk.
Mar. 31, 1925	Bethune War Memorial. Assessor, Sir Aston Webb, P.R.A. Apply Secretary, Imperial War Graves Commission, 82 Baker Street, W.1.
May 1, 1925	The United Grand Lodge of England invite designs for re-building the Freemasons' Hall in Great Queen Street, Kingsway, London. Apply, with deposit of one guinea, to the Grand Secretary, Freemasons' Hall, Great Queen Street, London, W.C.2. The envelope should be marked "M.M.M. Competition."
No Date	Memorial to the Missing at Cambrai and Soissons. Apply The Secretary (Works), Imperial War Graves Commission, 82 Baker Street, W.
No Date	Adding a second story to the Rhyl Conservative Club premises. Apply The Secretary, Market Street, Rhyl.
No Date	Methodist Church, School Hall, and Manse, in Sheffield Suburb. Apply Mr. T. A. Hardy, 24 Thornsett Road, Sheffield.

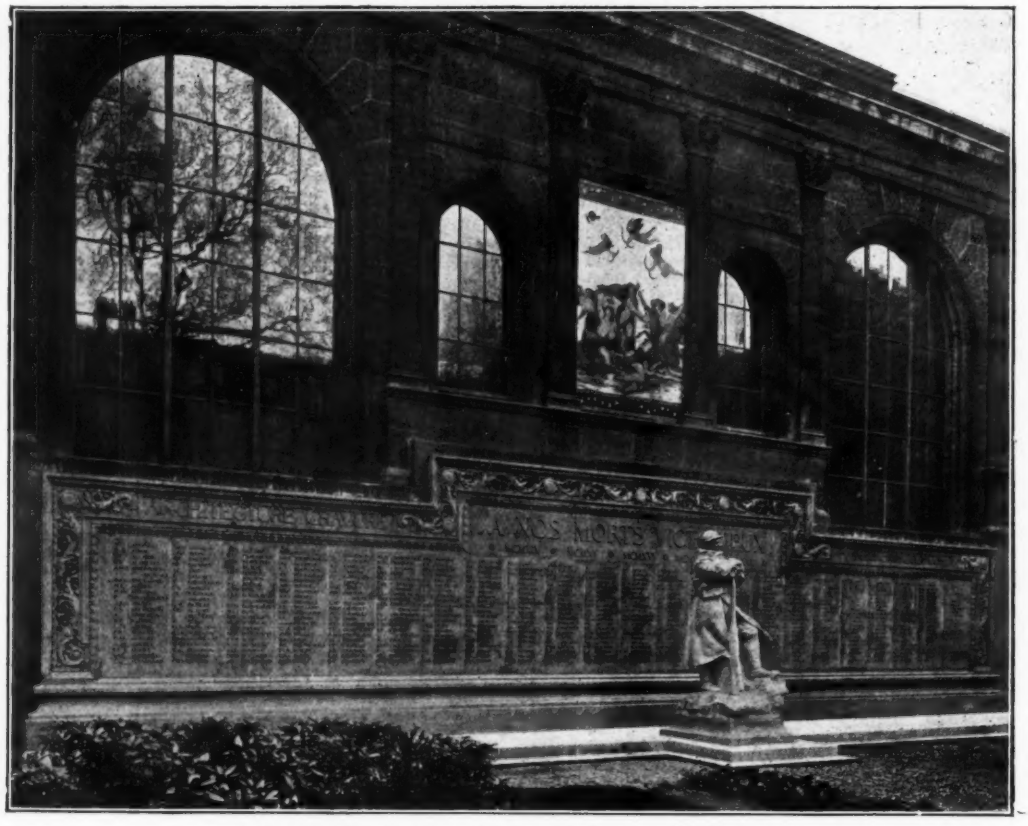
Competition News

The Rebuilding of the Freemasons' Hall.

It may be recalled in connection with the competition for designs for the rebuilding of the Freemasons' Hall in Great Queen Street, London, that the architect responsible for the original Hall was Thomas Sandby, whose building was erected in 1775-6 on a garden at the rear. Since that time numerous alterations and enlargements have been made, and in 1863 practically the whole of the present structure, except the temple, was rebuilt to the designs of the late Frederick Pepys Cockerell. The frontage in Great Queen Street, with the exception of a recent addition to the westward, is as designed by him.

The Ecole des Beaux-Arts War Memorial

A recent issue of the "R.I.B.A. Journal" contained an account by Mr. H. Bartle Cox, A.R.I.B.A., of the inauguration ceremony of the war memorial of the Ecole des Beaux-Arts. The design of the monument is due to the collaboration of Monsieur Alexandre Marcel, architect to the Ecole, who has kindly provided the accompanying illustration, and to the sculptor, Monsieur Jean Boucher, who executed the statue representing the Poilu. The back of the monument is in pink stone from Burgundy (Comblanchien); at the top on the left are the words "Architecture—Gravure," in the centre, "A Nos Morts Victorieux, 1914, 1915, 1916, 1917, 1918," to the right, "Peinture—Sculpture," then a list of the 470 students. The Poilu in characteristic attitude is in a stone also from Burgundy (Poilnay). In order to place this monument in the Ecole des Beaux-Arts it was necessary to take down the painted coloured plaster casts of faïence by Della Robbia. They have been cleaned and placed in the vestibule at the top of the staircase leading from the Cour du Murier to the Salle de Melpomene.



THE WAR MEMORIAL OF THE ECOLE DES BEAUX-ARTS.
ALEXANDRE MARCEL, ARCHITECT. JEAN BOUCHER, SCULPTOR.
(From the Journal of the R.I.B.A.)

Illuminated Finger Posts

The two sketch designs for finger-posts reproduced below are by students of the Architectural Association. The "programme" was as follows: "In a new town it is desired to erect posts where necessary at the road junctions, which, in addition to guiding the traffic, should be a decorative feature of the town. For this programme a three-way post is to be considered, the road junction being T-shaped.

"Any suitable material may be used. The height to the highest lettering is to be about 10 ft. Colour may be introduced."

Dr. Waldo's "Fire Card"

Dr. Waldo, the City of London Coroner, in his 22nd annual report (for 1923) states that under the City of London Fire Inquests Act of 1888—which is unique in its scope in Great Britain—it is his duty to conduct judicial inquiry into the cause and all the circumstances (including construction and means of escape from fire) of non-fatal as well as fatal fires in the City of London. As City Coroner he has power to send persons on his inquisition direct for trial for arson or incendiarism. Two aliens were convicted and punished for arson on his inquisition alone in 1921.

Dr. Waldo also reports that, in giving evidence before the Royal Commission on Fire Brigades and Fire Prevention of 1923, he agreed with the unanimous finding of the Departmental Committee of the Home Office who, in their Report of 1910, recommended that the benefits of the system of fire inquiry as carried out under the provisions of the local City of London Fire Inquests Act of 1888 should be extended to the country at large. He regards the Act as a strong deterrent against malicious fire-raising and as a prevention of carelessness and gross neglect as a cause of fires.

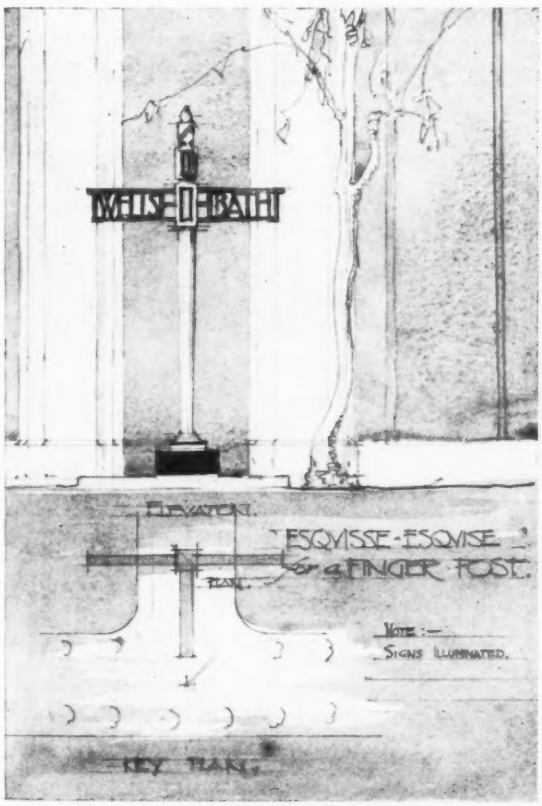
Dr. Waldo adds that the public generally are intensely ignorant about matters connected with fires, and that the education of the rising generation is the best insurance against unnecessary loss of life and property. He advises the London Corporation to distribute the "fire card" among offices, workshops, and other buildings in the 26 wards of the city, and the larger poster notices in public buildings and schools.

The "fire card," which, as a matter of fact, is now being distributed, contains advice drawn up by Dr. Waldo himself under the headings "What to do in the event of fire" and "Hints for the prevention of fire."

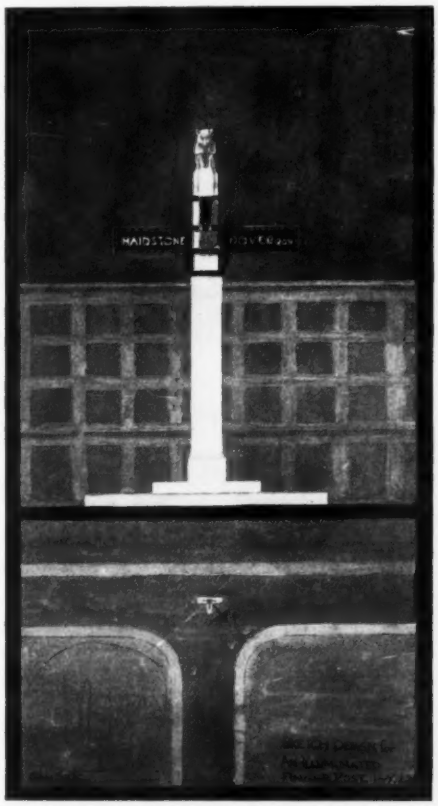
Copies of the fire card, and of the larger fire poster-notice, can be obtained from the Town Clerk, Guildhall, City of London.

The Stained-glass Windows of the Cairo Mosques

Writing on Cairo in "The Illustrated Carpenter and Builder," Mr. J. H. Kerner-Greenwood points out that the stained glass in the mosques is remarkable and altogether different from our stained glass. He says: I had an opportunity of examining one of the windows by climbing on to a roof. I found it was made of a plaster casting $\frac{7}{8}$ in. thick; behind the ornamental openings of the plaster slab bits of glass of irregular shape and different colours are fixed. The glass fragments are held in position by plaster of paris. There is no protection from rain or sun, except the head and sides of the window, and, therefore, this type of window can only be used in Egypt, where frost and snow are unknown and rain falls seldom, except near the coast. The geometrical designs of these cast plaster slabs form kaleidoscopic patterns which pleased me very much. At first I thought these windows could be made and sold cheaply in England, because it is very simple to cast a pierced plaster slab $\frac{7}{8}$ in. thick, and girls could place the bits of glass into position by means of plaster. Another sheet of glass at the back of the entire window would keep out the weather, and the result would be a unique and artistic window-light. But I have altered my opinion since I have thought of it, because in England we have very few *fast* lights, and, of course, plaster slabs could not be made to open and shut. If a man were putting up a building with fast lights and wanted a decorative Oriental effect he could not do better than follow the style of these Egyptian plaster slabs. You can see three of these lights (rather poor in colour) in the South Kensington Museum in the window at the top of the stairs leading to Room 133. In some of the mosques I saw marble and mother-o'-pearl mosaic ornamentation on the walls and pillars, and some good ornamental stucco work.



"AN ILLUMINATED FINGER POST."
MISS A SLEIGH.



"AN ILLUMINATED FINGER POST."
MR. G. W. SILK.

The Concealment of Heating Pipes and Apparatus

The remarks of Mr. William Harvey in the article on "Little Things That Matter" published in our issue for August 20, call, in the opinion of Messrs. Richard Crittall & Company, Ltd., of 43, Bloomsbury Square, London, W.C.1, engineers and contractors, for a certain amount of amplification so far as they refer to the necessity for concealment of heating pipes and apparatus. They write: "There is no doubt that radiators are very largely regarded as necessary evils by architects and users of large buildings, and it is important to draw attention to the fact that it is possible, without the use of exposed pipes or radiators, to heat any type of modern building, not only as economically and effectively as, but also in a manner which avoids a number of the disadvantages of, the radiator system, both from the point of view of appearance and hygienic effect.

"The system of heating known as the panel system, in which the necessary heating is imparted to the occupants and contents of the buildings by radiant heat from the ceilings and walls, is now coming into very general use, and a number of examples of it are to be found not only in large public buildings in London and the provinces, but also in commercial establishments and private houses.

"The effect, when the panels are disposed in the ceilings, is that of mild and cheerful sunshine (indeed, the heat of the sun is imparted to the inhabitants of the earth in exactly the same manner); and there is a complete absence of heated surfaces either of pipes or radiators to attract dust and dirt, or to cause its dissemination throughout the interior of the building."

"The Mechanical Boy"

There is nothing so inexhaustible as the curiosity of the average boy. He wants, quite rightly, to know the why and the wherefore of everything, and sometimes he ask questions which are embarrassingly difficult to answer. It will please parents, as well as the rising generation, therefore, to hear that at last a weekly paper has appeared—"The Mechanical Boy," price 3d.—which should keep the reader interested and absorbed for a long time. The first number, besides excellent feature articles on "Wireless in Aeroplanes" and "Science at Scotland Yard," contains the opening chapters of a serial by Edgar Wallace, dealing with adventures which follow the opening up of wireless communication with an amazing planet. There are, in addition, many other articles, such as "The World's Largest Ships," "A Turbo-Electric Locomotive," and "Making a Loud Speaker," covering all sorts of subjects from wireless and engineering to simple constructional work, as well as an intriguing page of puzzles, and a series of prize competitions. The paper is illustrated by unusual and striking photographs, and is altogether one which any boy will be delighted to read.

"The Mechanical Boy." Percival Marshall & Co., 66 Farringdon Street, London, E.C. 4. Weekly 3d.

New Inventions

Latest Patent Applications.

19332.—Burney, C. D.—Manufacture of artificial wood and of building elements thereform. August 14.
19404.—International Copperclad Co.—Roofing material. August 15.
19409.—International Copperclad Co.—Roofing element, and method of making same. August 15.
19414.—International Copperclad Co.—Manufacture of roofing material. August 15.
19251.—Murray, F. T.—Gutters and roof surfaces. August 13.
19578.—Bennett, W. J.—Blocks, boards, etc., for floors, walls etc., August 18.
19600.—Godenir, A.—Pre-cast reinforced concrete retaining walls. August 19.

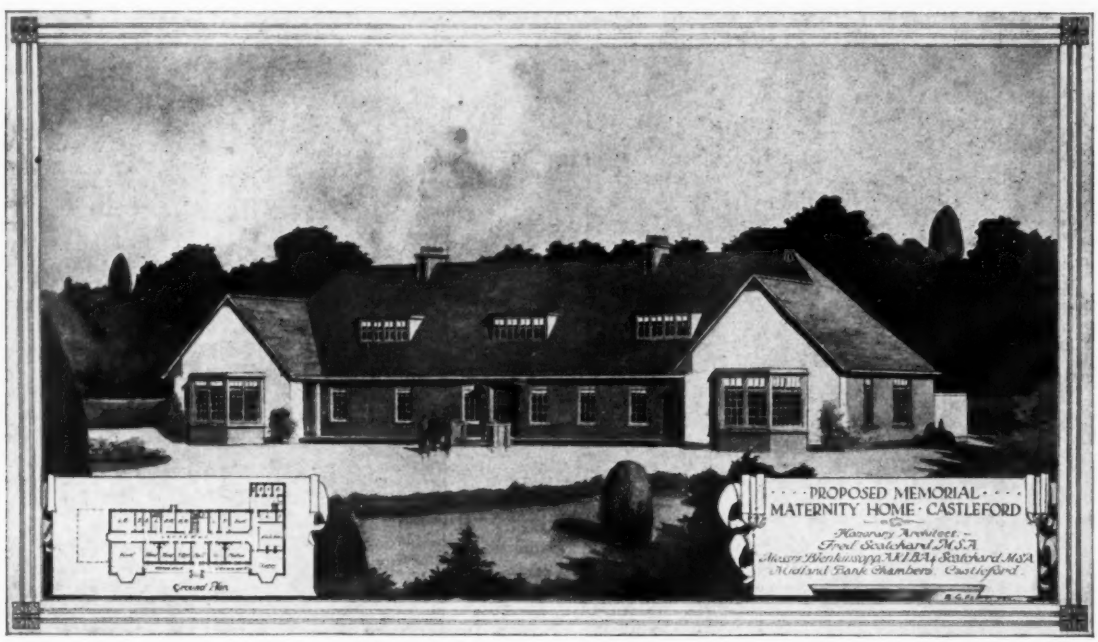
Specifications Published.

219718.—Abraham, H., and Ruberoid Co., Ltd.—Roof coverings.
219759.—Ferneyhough, J.—Construction of iron or steel reinforcement for concrete floor slabs and the like.
219859.—Blanchford, H. H.—Means for use in making walls and other structures of concrete or the like.
220106.—Rogers, R. H.—Concrete structures.
215296.—Watson, C. W.—Reinforcements for concrete and the like.
220204.—Rogers, R. H.—Movable shuttering for use in concrete constructural work.

Abstracts Published.

218093.—Debongnie, E., of 66 Rue d'Hauteville, Paris. Roofs.
218537.—Baude Frères et Cie, 102 Rue St. Pierre, Marseilles, France.—Roofs.

The above particulars are specially prepared by Messrs. Rayner & Co., registered patent agents, of 5 Chancery Lane, London, W.C.2, from whom readers of the JOURNAL may obtain all information free on matters relating to patents, trade marks, and designs. Messrs. Rayner & Co. will obtain printed copies of the published specifications and abstract only, and forward on post free for the price of 1/6 each.



PROPOSED MEMORIAL MATERNITY HOME, CASTLEFORD. FRED SCATCHARD, M.S.A. (BLENKINSOPP AND SCATCHARD), HONORARY ARCHITECT